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Measuring Quality Standards, Assessment Practices, and Outcomes/Effectiveness of Competency-Based Education (Cbe) Using Mixed Methods Research to Determine Cbe's Vitality

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MEASURING QUALITY STANDARDS, ASSESSMENT PRACTICES, AND OUTCOMES/EFFECTIVENESS OF COMPETENCY-BASED EDUCATION (CBE) USING MIXED METHODS RESEARCH TO DETERMINE CBE'S VITALITY

by

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ABSTRACT

Competency-based education (CBE) has been around since the late 1800s but has recently served as a revamped pedagogy designed to respond to some of higher education's most pressing issues today: low degree attainment and problems of equity; lack of alignment between education and the job market; low and slow graduation rates; high tuition; and poor academic quality. Despite the promises of CBE to resolve these issues, the approach to learning lacks much empirical data. The researcher provided a summary of current research on CBE and identified gaps in the literature. Three gaps were identified including why CBE had failed in the past (and how the reasons for its previous failures are being used today in new CBE quality standards), literature on assessment practices (and how institutions are or are not following these best practices), and reporting on student outcomes including graduation, race/gender equity, and job placement compared to traditional programs. These three gaps led to the creation of three research questions directed by three theoretical frameworks (Lewin's 3-Stage Theory of Change and Force Field Analysis, Bigg's constructive alignment theory, and Christensen's theory of disruptive innovation), as well as one conceptual framework (phenomenology) to tie the study together. The research questions were addressed using multiple research methods including a rubric-based assessment, qualitative interviews, and statistical analyses. All the questions in this dissertation were related to the overall purpose, which was to evaluate whether CBE will have vitality in American higher education today. Vital success was defined as two or more research questions having positive or successful results. Failure was defined as fewer than two research questions having positive or successful results. Based on the results of RQ 1, RQ 2, and RQ 3, the

competency-based education movement will likely fail again. However, it is hoped that this research will provide valuable information to those working in competency-based education so they may adjust their programs for better chances of vitality.

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DEDICATION

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This dissertation is dedicated to all those who work in competency-based education. May this research be helpful to you and your programs.

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LIST OF ILLUSTRATIONS

LIST OF ABBREVIATIONS

AAC&U	Association of American Colleges and Universities
ACT	American College Testing
AIR	American Institutes for Research
AP	Advanced Placement
CAEL	Council for Adult and Experiential Learning
CAEP	Council for the Accreditation of Educator Preparation
CBE	Competency-Based Education
CBEN	Competency-Based Education Network
CCA	Complete College America
CLEP	College Level Examination Program
CIP	Classification of Instructional Programs
CSV	Comma Separated Format
DSST	Dante's Subject Standardized Tests
DQP	Degree Qualifications Profile
IB	Interactional Baccalaureate
IPEDS	Integrated Postsecondary Data System
IRB	Institutional Review Board
LEAP	Liberal Education and America's Promise
NCES	National Center for Education Statistics
PDF	Portable Document Format
PLA	Prior Learning Assessment
RQ 1	Research Question 1
RQ 2	Research Question 2
RQ 3	Research Question 3
RQ 3.1	Research Question 3.1 covering graduation data only
RQ 3.2	Research Question 3.2 covering race/sex equity data only
RQ 3.3	Research Question 3.3 covering job placement data only
RQ1-H1	Research Question 1, Hypothesis
RQ2-H1	Research Question 2, Hypothesis
RQ3.1-H1	Research Question 3.1, Hypothesis
RQ3.2-H1	Research Question 3.2, Hypothesis
RQ3.3-H1	Research Question 3.3, Hypothesis
SAT	Scholastic Aptitude Test
SAV	Statistical dataset for SPSS
SPSS	Statistical Package for the Social Sciences
URL	Uniform Resource Locator
VALUE	Valid Assessment of Learning in Undergraduate Education
WGU	Western Governors University

CHAPTER I - INTRODUCTION

Background of the Social Problem

Benefits of Higher Education and Social Problem Explained

"The quality of life enjoyed by the people of the United States in the opening years of the new millennium rests in substantial part on the broad foundation provided by the American university during the twentieth century" (Rhodes, 2001, p. 1). The foundation, or purpose, of higher education institutions are to teach, train, research, and provide service to their communities. When institutions align with their purpose, there are benefits to society in terms of economics, equity, health, crime prevention, volunteerism, political participation, and more.

First, higher education provides a socioeconomic benefit for individuals because those who have higher levels of education tend to make more money (Economics of Higher Education, 2012; Factsheet: New Federal Guidelines and Resources to Support Completion and Success in Higher Education, 2016). Because of this, higher education provides an economic benefit to communities because a larger tax base means the community may have better resources such as schools and roads (Bedroussian, DeVol, Shen, & Zhang, 2013; Chong, Kanter, Nassif, & Ochoa, 2011), but also that an educated citizenry can rely less on other forms of government assistance (Broad, 2017). In addition, higher education is an economic benefit for the country because the United States is better able to contribute globally when its citizens are educated (West, 2012).

Second, higher education provides a positive benefit to society because it can offer opportunities for a more equitable world. As more African Americans, Hispanics, Native Americans, women, and other historically oppressed groups have access to college, the

more likely they are to rise to a higher class and then hold more powerful, high-paying positions in society (Degrees of Hope, 2014; Equal Access to Education, 2012). This is important to better balance power and privilege across society.

Third, higher education provides a societal benefit as well. Studies indicate that people with higher levels of education correlate with smoking less (Vital Signs, 2010), weighing less (Socioeconomics and Obesity, n.d.), having lower levels of incarceration (Saving Futures Saving Dollars, 2013), volunteering more (Volunteering in the United States, 2016), voting more often (Milstein-Sondheimer & Green, 2010), and even higher levels of happiness (Broad, 2017) than those correlating with lower levels of education. Despite these societal advantages, data show that higher education could be doing better to serve American society today. Several arguments support this.

Degree attainment and equity.

The first argument that indicates a need for improvement in higher education includes data from the Census (Ryan & Bauman, 2016), the National Center for Education Statistics (NCES) (Stronger Nation, 2016), and the Pell Institute and Penn Ahead (Indicators of Higher Education, 2016). These data show that while the degree attainment rate –the number of people completing a college degree– has increased nationwide, it is still below where it needs to be (according to "pressures to change higher education" detailed later in this chapter). The rates of degree attainment in the United States in terms of demographic differences are significant (Ross et al., 2012). In 2014, the proportion of Americans who had degrees was 40.4%, while 59.6% did not (Stronger Nation, 2016). Along racial lines, the Census reports 45% of whites hold a college degree, 28% of African Americans hold a college degree, 20% of Hispanics hold a

college degree, 23% of Native Americans hold a college degree, and 60% of Asian-Americans hold a college degree (Ryan & Bauman, 2016). These are statistically significant differences in the attainment of higher education among racial groupings. NCES statisticians indicate America will become less and less-white; thus, more non-white people must hold college degrees to enjoy the benefits higher education brings to American life (Stronger Nation, 2016). (An important note here is the difference between equity and equality; please see the definitions section.)

A study from the Lumina Foundation indicates that many Americans realize the importance of degree attainment, but they also recognize the barriers to boosting degree attainment in the United States including price, time, and other responsibilities of modern-day students (America's Call for Higher Education Redesign, 2013). The barriers to degree completion are then compounded not just by racial inequities but economic disadvantages and inadequate academic preparation as well (Flores, n.d.). *Putting Students First* (n.d.) reported that four out of five wealthy 24-year old people had a bachelor's degree while only 11% of 24-year old people from the lowest income group had one. Furthermore, those lower income individuals who enter a higher education institution often play academic catch-up to those from higher-income groups because they are not adequately prepared for college-level work (Chait & Venezia, 2009). For online programs, the preparation level could be worse because, according to one report, low-income students frequently lack the technology to participate in online education and are inexperienced with the required equipment (Bidwell, 2013).

From an international perspective, U.S. degree attainment rates compared to other developed countries is lower as well. "Harvard economist Richard Freeman estimates that

America's share of the total number of postsecondary students worldwide fell from 29 percent in 1970 to just 12 percent in 2006, a 60 percent decline" (West, 2012, p. 12). Steele (2017) reported that America is ranked in 11th place for global postsecondary degree attainment. Reasons for this decline include China and India boosting degree attainment while the U.S. increased enrollment but failed in the retention of students to earn a degree (West, 2012). *Putting Students First* (n.d.) stated that 60 million Americans lack higher education, and that 37 million have completed some form of education but dropped out prior to graduation.

Job market.

The second argument that indicates higher education could better serve Americans includes data about the job market. While much of the projected job force in the near future to 2024 includes jobs not requiring any form of college degree such as personal care aids, food servers, retail salespersons, customer service representatives, and construction workers, the fastest growing occupations for the long-term future do require postsecondary education (U.S. Bureau of Labor Statistics, 2015). The fastest growing occupations include energy specialists, physical therapists, nurse practitioners, statisticians, research analysts, and financial advisors, among others (Occupational Employment Projections, 2015). These jobs will be needed in the long-term, and higher education must offer programs for these types of occupations to truly serve the American people.

Lumina also supports this argument about jobs. In their report called *A Stronger Nation* (2006), they reported that "virtually all new job growth in the U.S. post the 2007 recession is in jobs requiring some form of postsecondary education" (p. 6). In 2009,

former President Obama stated, “of the 30 fastest growing occupations in America, half require a Bachelor’s degree or more” (Kanter, Ochoa, Nassif, & Chong, 2011, p. 3). However, not all job growth will require a Bachelor’s degree or higher. A study out of Georgetown University confirmed this; according to the study, “out of 11.6 million jobs created in the post-recession economy, 11.5 million went to workers with at least some college education and, of those, 8.4 million went to workers with a bachelor’s degree or higher” (Broad, 2017, p. 36). A high school diploma is not enough; more people with higher levels of degrees will be needed to fill these fast-growing occupations (Perna, n.d.).

Graduation rates and tuition.

The third argument that indicates higher education could better serve America are data showing low graduation rates and high tuition. Many students who do have degrees are not graduating on time (i.e. within four years) for their Bachelor’s degree (Four Year Myth, 2014). Fifty out of 580 public institutions report that only 50% of their students graduate in four years (Four Year Myth, 2014). According to the National Center for Education Statistics Fast Facts (2017), “the 6-year graduation rate for first-time, full-time undergraduate students who began seeking a bachelor's degree at a 4-year degree-granting institution in fall 2009 was 59 percent” (p. 1). Because Bachelor’s degrees are taking longer to complete, they are more expensive.

In addition, tuition and fees continue to increase every year. The College Board reported “average published tuition and fees at public four-year colleges and universities increased by 13% in 2015 dollars over the five years from 2010-11 to 2015-16, following a 24% increase between 2005-06 and 2010-11” (Tuition and Fees, n.d., p. 2). The U.S.

Department of Education also reported that "over the past three decades, tuition has more than doubled even after adjusting for inflation" (Fact Sheet, 2015, p. 1). A decline in state aid is one of the reasons for the increase in tuition. Since 2008, public funding for higher education has decreased drastically (Coleman, 2016). In the last 10 years, Arizona experienced a 56% reduction in state aid, Wisconsin had a 25% reduction, Pennsylvania had a 33% reduction, and Illinois had a 54% reduction (Coleman, 2016). Both factors, time-to-completion and cost, are leading students to a large amount of debt (Kantrowitz, 2016). Craig and Markowitz (2017) reported that student loan debt is the second largest debt after home mortgages with the average graduate from 2016 owing $37,000 in student loans.

Quality.

Finally, the fourth argument that indicates higher education needs to improve includes the quality of a college degree being questioned. Rojstaczer and Healy (2012) reported that grade inflation is one reason for this. "A's represent 43% of all letter grades, an increase of 28 percentage points since 1960 and 12 percentage points since 1988" (Rojstaczer & Healy, 2012, p.1). Berkeley (2015) noted that 45% of college students' learning did not increase within their first two years at the institution.

In addition, the quality of higher education is questioned due to college graduates' difficulty obtaining jobs for which they are educated (Goodman, 2015) because many are not employment ready (Hart Research Associates, 2015; Gee, 2017; *Putting Students First*, n.d.) or because their academic major did not lead to a particular occupational goal (Craig & Mackowitz, 2017). Craig and Markowitz (2017) stated that while only 5% of college graduates are unemployed, 45% of graduates are working in jobs that do not

require a college degree and are thus underemployed. In a focus group conducted by the American Council on Education, most participants stated that the economic value of a degree has stagnated or declined in recent years (Broad, 2017). Weise (2014) cited that only 11% of business leaders think students are career-ready while 96% of chief academic officers believe they are. Clearly, there is a discrepancy. Institutions need to be more accountable to shaping their graduates into individuals ready for career or further education on day one out of the college or university.

Pressure to Change Higher Education

The following quote was provided at the beginning of this paper: "The quality of life enjoyed by the people of the United States in the opening years of the new millennium rests in substantial part on the broad foundation provided by the American university during the twentieth century" (Rhodes, 2001, p. 1). Much like in the opening years of the new millennium, the outcomes of higher education today could play a more substantial role in ensuring the quality of life for all Americans. These data about degree attainment, equity, tuition, the job market, and poor academic quality are concerning enough that associations, accreditors, and governmental bodies (all bulleted below) have taken notice and are pressuring colleges and universities to change.

- The *Spellings Report* called for colleges to increase access, graduate students more quickly, control costs, and be transparent about student performance (Spellings, 2006).
- Accreditors are mandating that colleges demonstrate their value by providing indicators of student learning (Mitchell, 2016).

- The Lumina Goal encourages colleges to offer quality programs aligned to their *Tuning USA Degree Qualifications Profile* (DQP) that details what students should be able to know and do at the associate's degree, bachelor's degree, and master's degree levels (Adelman, Ewell, Gaston, & Schneider, 2014).
- Former President Obama created a goal that 60% of all Americans will complete some form of postsecondary education by the year 2020 (Meeting the Nation's 2020 Goal, 2011). Former President Obama stated that this was a top priority in order to compete internationally, stating in 2009 that "America cannot lead in the 21st century unless we have the best educated, most competitive workforce in the world" (Chong, Kanter, Nassif, & Ochoa, 2011, p. 3).
- The Lumina Foundation created a similar goal to that of former President Obama's, but it extends to 2025 (A Stronger Nation, n.d.).
- To complement Former President Obama's goal, his administration created a *College Scorecard* for student consumers to compare colleges on selected outcomes before deciding to attend (US Department of Education College Scorecard, n.d.).
- The American Institutes for Research created *College Measures*, a similar tool "enabling users to make smarter decisions as well as create a more efficient, productive, and effective higher education system" (College Measures, n.d., p. 1).

These pressures have disrupted the status quo of higher education institutions. Historically viewed as slow moving, colleges and universities have scrambled to adjust their programs to the apparent needs of society.

Complete College America.

Many traditional programs have created student learning outcomes and have reformed their programs to align with Complete College America (CCA) or other similar organizations.

> Complete College America is a national nonprofit with a single mission: to work with states to significantly increase the number of Americans with quality career certificates or college degrees and to close attainment gaps for traditionally underrepresented populations (Complete College America: About CCA, 2014).

While it is not required that states join the CCA alliance, 36 states have committed to this reform of traditional programs thus far (Complete College America: Alliance of States, 2014). CCA works to achieve their mission through what they call *Game Changers*. According to CCA, the *Game Changers* can lead to higher degree completion rates. The *Game Changers* include: performance-based funding so colleges who make more progress receive more funding; co-requisite remediation so students have more support in lower-level, gateway courses; 15-credits defined as full-time enrollment so students understand it takes more than 12-hours a semester to graduate in four-years; structured schedules so classes are offered in predictable sequences semester-to-semester; and guided degree plans so students have a clear idea of what a four-year plan looks like beginning their freshman year (Complete College America: The Game Changers, 2014). CCA also encourages states to find pathways for their citizens to complete a degree, even when the citizen has not been a student for quite some time.

There has already been some success with these CCA initiatives. Mississippi, for example, is a member of the CCA alliance. Out of this alliance, Mississippi created their own initiatives called *Finish in 4* and *Complete 2 Compete*. With *Finish in 4*, the *Game*

Changers are used when creating degree plans. With *Complete 2 Compete,* the state board of Mississippi gathered coursework data on all students from their state institutions. The state then performed an audit to see if a student was less than a semester away from completing a degree in a discipline, with courses taken from any of the Mississippi institutions. The state has seen a great deal of success with *Complete 2 Compete* thus far. In their audit, they found that almost 70,000 former Mississippian students had enough credit to earn a degree right away (Mississippi Public Universities, 2016). That number did not include people who were only a few courses away from a degree. Since the *Complete 2 Compete* initiative was launched, the state has been trying to contact these students to get them their diplomas and/or help them get enrolled somewhere to completely finish their degree. While many colleges are moving toward these initiatives built from the CCA alliance, some institutions are taking other approaches in response to the pressures (bulleted earlier) for higher education to change.

Competency-Based Education.

One approach to improving higher education is competency-based education (CBE). CBE is an education framework built around competencies, or outcomes, not time. Unlike CBE, traditional education is tied to the credit hour and the credit hour is tied to time based on Carnegie Units (a measure created in the late 19th century to assign a worth or value to a student's course load). "The standard Carnegie Unit is defined as 120 hours of contact time with an instructor, which translates into one hour of instruction on a particular subject per day, five days a week, for twenty-four weeks annually" (Silva, Toch, & White, 2015, p. 8).

CBE is different from traditional education that is tied to the Carnegie Unit because when students have learned what they are supposed to, they do not have to wait until the end of a semester for completion; instead, they can move on to the next module. The two key features of a CBE program include institutional agreement on 1) what their graduates should know (competencies) and 2) how their students can demonstrate they know it (assessment) (Bral & Cunningham, 2016; Van der Klink et al., 2007). Competency-based education is an education program where outcomes are decided first, and then authentic/real-world assessments are built to measure those outcomes. For example, many BS in computer science programs are built around which courses computer science faculty want their students to take to complete their degree. In a CBE computer science program, the faculty would begin by thinking about the student learning outcomes they want their graduates to accomplish. The faculty would then think about what types of competencies lead to these outcomes, and then begin to cluster competencies into specific assessments. When a student masters all their competencies on their own time, they can graduate. A formal definition of CBE from the Council for Adult and Experiential Learning (CAEL) is below; Tate and Klein-Collins (2015) said:

> Competency-based education is a term used for programs that focus more on what students have learned, rather than where or how long the learning takes place. Instead of evaluating student progress primarily on the amount of time spent in a classroom (using the credit hour, which is the default standard for measuring progress), students receive college credit based for their actual demonstration of skills learned. CBE programs are designed to improve the quality of higher

education by putting the focus squarely on a demonstrated learning outcome. (p. 2)

Figure 1 provides an example of what a competency-based education program looks like. This example is from the University of Wisconsin's Flexible Option Extension Campus (2014), and the software they use for their CBE programs is Desire2Learn. When a student logs in to the system, they are presented with several competencies. Figure 1 is what displays when a student clicks into one of the competencies. The first link includes the learning resources for the student to review. Once the student feels comfortable with their knowledge of the 'learning resources' material, they can move onto the next link titled 'practice assessment.' After the student takes a practice exam, they can move onto the formal assessment(s). In this example, there are two formal assessments: a 'proctored assessment' and an 'assessment activity.' Once the student has successfully completed those formal assessments, they can move onto their second subset/group of competencies (not displayed in the screenshot). For more examples of what a CBE program looks like at different institutions, see Appendix A.

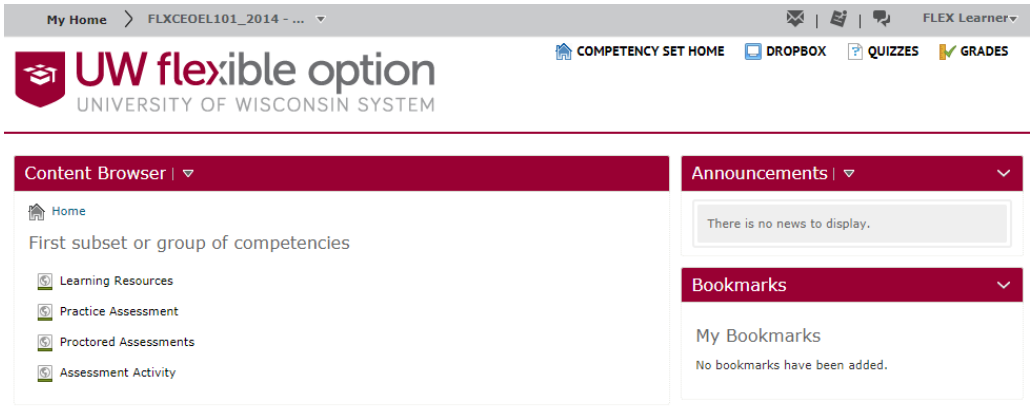

Figure 1. Screenshot of Competency-Based Education Program at Wisconsin Flex.

Reprinted from UW Extension website, n.d., Retrieved from https://flex.wisconsin.edu/how-uw-flexible-option-works/#sample-competency-set.

To further define CBE for the reader, another explanation of what CBE is not may be helpful. In addition to being different than traditional education, CBE is also different than credit-by-exam (sometimes referred to as prior learning assessments). These credit-by-exams/prior learning assessments include Advanced Placement (AP) exams, College Level Examination Program (CLEP) exams, International Baccalaureate (IB) exams, military exams like the Dante's Subject Standardized Tests (DSST), and non-standardized learning credits from the American Council on Education. CBE is different than credit-by-exam because a student cannot earn an entire degree via credit-by-exam. Many colleges have a cap on how many credits can count toward the degree via credit-by-examination. In addition, most credit-by-exams are only offered at the introductory level. To earn a degree, more advanced knowledge is needed. Finally, some of these exams are only available to select people. For example, only high school students may take the AP and CLEP exams. And, only military personnel may take the DSST exams.

CBE is different than the credit-by-exam option because in credit-by-exam, students are utilizing their prior knowledge to take the exam. In CBE, students may use their prior knowledge to complete their competency assessments, but they do not have to. CBE does not only assess students, it teaches them the material. Having said that, students can learn at their own pace in CBE; if they already feel comfortable with the competency, they can go ahead and take the assessment and skip all the learning materials (Tate and Klein-Collins, 2015). CBE is also different than credit-by-exam because the assessments vary. While these credit-by-exams are only exam-based, CBE uses fewer exam-based assessments and more authentic assessments. "Authentic assessments evaluate real-world competencies and the ability of students to perform in complex scenarios" (Everhart, 2014, p. 2). An authentic assessment that a CBE program might require for a computer science degree is a project on programming, while a credit-by-exam may instead require the memorization of programming language. Because of this, CBE teaches to the test less than credit-by-exams.

In a report called *Cracking the Credit Hour*, Laitinen (2012) detailed what CBE is by giving an example of who CBE might help. Laitinen (2012) detailed the life of an imaginary woman named Juliana, a first-generation college student who struggled to balance school and life needs. Juliana could not afford a four-year degree, so she enrolled in a two-year program at a community college. She made good grades despite both working and going to school, but eventually needed to withdraw to take care of her ill father. After a while, she got a job and did not return to school. However, to earn a promotion, her work required she obtain a bachelor's degree. By this time, Juliana had a family of her own. No public institution was nearby, but there was a private one close to

her home. Having said that, the private institution would not accept much transfer coursework from her earlier days at the community college; the private institution was expensive; and the times the classes were offered did not meet her needs as a working adult with a family. In addition, as someone now in her late-20s with several years of work behind her, she felt inherently different than an 18-year old right out of high school both in terms of maturity but also in practical knowledge of the field. Laitinen (2012) suggested CBE might be the exact kind of education Juliana needed because she could work at her own pace, the price would be less expensive than a traditional degree, and she could use the knowledge she already had from the field to earn credit toward her degree.

Laitinen (2012) also suggested that the story of Juliana is now the norm of college students, not the exception. Ross-Gordon (2011) agreed and stated that 70% of current college students are, in one way or another, non-traditional. Steele (2017) estimated this percentage to be even higher at 85%. Kamenetz (2014) stated that the pool of traditional students is decreasing while tens of millions of adult students are searching for a way to complete their degree.

Model of Chapter I

Figure 2 illustrates the content of Chapter I thus far. Starting from the left, social issues of low degree attainment and problems of equity, poor alignment to the job market, low graduation rates and high tuition, and questionable academic quality have all led to pressures being made on higher education. Higher Education's response to these pressures has been through new pedagogies like CBE or through other initiatives like CCA. Based on these responses, the results of these decisions still need to be evaluated for effectiveness in correlating back to resolving the initial social issues. This dissertation

will focus on CBE.

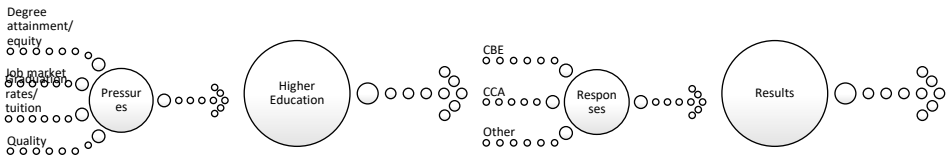

Figure 2. Model to Explain Chapter I

Current Research on Competency-Based Education

Theoretically, CBE holds much promise. A quality CBE program incorporates designed competencies based on research and professional needs, uses validated assessments, is less expensive than a traditional degree, allows for more students to graduate in less time than four-year institutions, and, because of its flexibility, provides an avenue for non-traditional student learners to earn a college degree. While there are countless reports about CBE, there is not a great deal of empirical research on the quality of CBE programs. That research which does exist is divided into four subcategories: 1) research on program development, 2) research on implementation and outcomes, 3) research on perceptions, and 4) case study research on particular CBE programs. To ensure reader flow, these subcategories of research are not detailed in Chapter I. Instead, they may be found in Appendix B. The research from Appendix B is, however, outlined below so the reader may know broadly the research that currently exists on CBE. Some of the research reflects positively and some of the research reflects negatively on competency-based education.

- Subcategory 1: Research on CBE Program Development
    - CBE Models
    - Process of Program Creation
    - Themes of Program Development
    - How to Create CBE Programs by Academic Major
    - Resources to Help with Program Development
    - Assessment
    - Change of Faculty Role
    - Technology Needs
    - Educational Platform
- Subcategory 2: Research on CBE Implementation and Outcomes
    - Implementation of a Program
        - Target Student Population
        - Transcription
        - Regulatory Environment
    - Outcomes of a Program
        - Time to Completion
        - Cost
        - Graduation and Employment Rates
        - Comparison to Traditional Programs
        - Review of Historical CBE Programs
        - Program Evaluation
- Subcategory 3: Research on People's Perceptions about CBE

    - Faculty Perceptions
    - Administrator Perceptions
    - Student Perceptions
    - Employer Perceptions
- Subcategory 4: Case Study Research on Selected CBE Programs

Problem Statement

As the researcher reviewed the literature on CBE (which is outlined above and summarized in Appendix B), gaps in the published material on CBE were identified, particularly regarding a lack of empirical research.

First, for many of the subcategories bulleted above, research studies have been conducted only once or twice, and those that exist (such as Adams et al., 2015; Kamenetz, 2013; and Sandeen, 2016) have yielded different results; thus, replication for the sake of reliability would be a positive contribution to the field of CBE literature. Additionally, there is a large gap in the research of assessment. Many reports (Johnstone & Soares, 2014; McClarty & Gaertner, 2015; McDonald, 1976; Rowen, 2015) indicate that CBE programs must focus on assessment, and there are reports on specific programs and what they do for assessment (Borin, Metcalf, & Tietje, 2010; Dwyer, 2016; Holmboe et al., 2010); however, there has not been reports based on the inspection of assessment practices of CBE programs. Also, CBE's contributions to a more equitable and diverse higher education establishment have not been empirically well-researched, meaning a limited number of empirical articles can be located when searching for this topic. Further, graduation and placement rates have been studied by individual programs but not on a more comprehensive level. Finally, CBE has been tried before. It was used in the 1960s

and, arguably, even before. (For a history of CBE, see Chapter II.) There is research on why CBE has failed before, but little research on whether institutions are avoiding that failure this time around. Without practical, empirical research on CBE, the effectiveness of this educational platform will remain speculative instead of being guided by evidence.

Purpose of the Study

A quote from the literature provided guidance for the purpose of this study. Corcoran wrote the following in 1976:

> I become concerned when people want immediate evaluation results on competency-based education. They say, 'Let's do a study on the competency-based approach and determine whether it works or not.' Well, that isn't the way things happen. You must have an operational program and you must have graduates before you can really tell whether the approach makes any difference in quality or cost. There is a need for a fair field test before one can judge whether the whole thing is worthwhile or not. (p. 20)

It has now been 42 years since Corcoran said this quote. The time for research is now. CBE now has a long-standing history adequate to permit research to determine whether CBE will help solve higher education and societal problems. The purpose of the study is to determine whether CBE is likely to be successful this time during the current regeneration of the educational platform.

Research Questions

The specific research questions surrounding the purpose of this research are best illustrated in Figure 3. Figure 3 illustrates how the first question feeds into the second, and the second question feeds into the third.

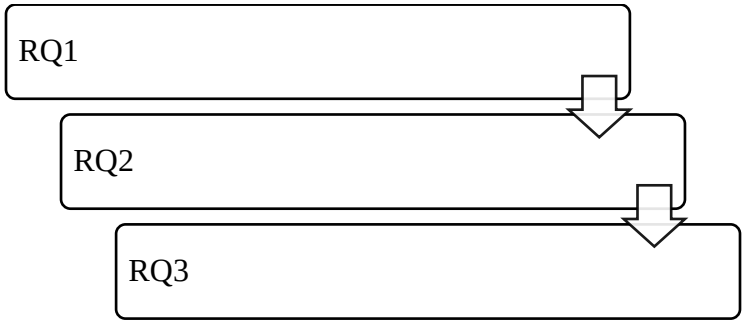

Figure 3. Relationship of Research Questions

In research question one (RQ1), the study seeks to determine whether the new quality standards released by CBEN (May 2017) will help to decrease the likelihood of CBE failing again.[1] In research question two (RQ2), the study seeks to determine what the policies and procedures are for assessment in CBE programs, and to see whether institutions are following best practices in assessment or not. In research question three (RQ3), the study seeks to review CBE's effectiveness by reporting on student outcomes including graduation (RQ 3.1), race/gender equity (RQ 3.2), and job placement (RQ 3.3) compared to the same student outcomes from similar, traditional programs. All the questions are related to the overall purpose, which is to evaluate whether CBE is likely to be successful this time. For the purposes of this dissertation, success will be defined as two or more research questions having positive or successful results. Failure will be defined as fewer than two research questions having positive or successful results. If fewer than two research questions have positive/successive results, CBE is less likely to

[1] The Competency-Based Education Network (CBEN), the professional association for institutions that offer CBE, created voluntary standards for institutions to follow when designing CBE programs. The purpose of the standards was to define what a quality CBE program is, as well as to influence policymakers and accrediting bodies in their regulation of the field. The C-BEN standards were released in draft form in October 2016 and the final version was released in May 2017. There are eight standards, all of which are detailed in Chapter II.

have be successful this time around; but, if two or more research questions have positive results, CBE is likely to be successful this time around.

Justification

Because CBE holds so much promise theoretically, there have already been many investments in it: 1) CBE has a professional network (the Competency-Based Education Network (CBEN)) which has released voluntary quality standards for CBE programs (Fain, 2016); 2) accrediting bodies are creating mandatory CBE standards (Brittingham, 2015); 3) the U.S. Department of Education has set-up a financial aid framework for it (Porter, 2014) through the Experiential Sites Initiative launched in July 2014 and November 2015; 4) roughly 600 institutions have already begun to implement some sort of CBE program (Fain, 2015b); and 5) many big-name organizations (including the Bill and Melinda Gates Foundation, Public Agenda, EDUCAUSE, the American Association of American Colleges and Universities, the Council for Adult and Experiential Learning, the Quality Matters Program, the American Council on Education, the Center for Education Attainment and Innovation, and Academic Impressions) have invested monies into the model hoping that it solves many of the societal problems detailed at the beginning of Chapter I. These are significant initiatives to support CBE. The research for this dissertation seeks to determine whether these investments have been worth the effort. For the purposes of this dissertation, "worth the effort" will be defined as two or more research questions having positive or successful results indicating that CBE is likely to be successful this time around.

Theoretical and Conceptual Framework Overview

Several theories support the purpose of this study. To determine whether the May 2017 CBEN quality standards will help to decrease the likelihood of CBE failing again (RQ1), Lewin's 3-Stage Theory of Change and Force Field Analysis will be used. These theories help to explain how organizations can change based on the acceptance of a different perception or driving force. Next, to determine whether CBE programs are following best-practice assessment procedures (RQ2), Bigg's constructive alignment theory will be used. Bigg's constructive alignment theory explains how curriculum should be built with defined outcomes. According to the theory, once outcomes are created, assessments can be designed to match the outcome; and then once assessments are created, the teacher aligns activities to the outcomes and assessment. Finally, to determine CBE's effectiveness in terms of student outcomes including graduation, race/gender equity, and job placement (RQ3), Christensen's theory of disruptive innovation will be used. Christensen's theory of disruptive innovation explains how a new product can enter a market, become widely accepted by the market, and thus require the old product to change to something like the new product, thereby altering what the market once was. To tie the study together for all research questions (1-3), a phenomenological conceptual framework will be utilized. Creswell (2007) defines phenomenology as a way to "understand shared experiences in order to develop a deeper understanding about the features of a phenomenon (CBE)" (p. 60).

Assumptions

An assumption is "a statement that is presumed to be true, often only temporarily or for a specific purpose" (Wargo, 2015, p. 1). The largest assumption of this study is

how the social problem was framed earlier in Chapter I and illustrated in Figure 2. The social problem section of this dissertation focuses on higher education being able to solve societal problems such as issues of poverty and racial/gender equity. Higher education cannot solve these societal problems on its own. K-12 education as well as societal resources and communities across the country must work to solve these problems. In addition, the *ability to solve* may be strongly worded. Higher education, K-12 education, societal resources, and positive communities may all *correlate* with societal benefits, but not necessarily *solve* societal problems. This is the difference between correlation and causation. Having said this, the researcher still decided to frame this study based on higher education's contribution to the solution of these problems. This was decided based on other sources framing the social problem this way as well. McGee (2015) described how society has changed demographically and economically, and suggested higher education must change to adjust to a new normal. The Institute for Higher Education Policy also described high tuition, income inequities, racial inequities, and degree completion as issues needing to be resolved for higher education to better serve American society (Cooper, 2017).

Initial Limitations

"Limitations are potential research weaknesses that are mostly out of the researcher's control, impacting the interpretation of research findings, because of, e.g., research design, statistical constraints, and access to audiences or data" (Young, 2016a, p. 1). In RQ1, a limit could occur if the CBEN standards (May 2017) change while the research is taking place. Another limit is only reviewing the standards, not the rubrics for the standards. CBEN has standards as well as rubrics to judge compliance with those

standards. Only the standards were reviewed as part of this question. A final limitation for RQ1 is that no rubric is designed perfectly. Thus, after the rubric is used, the researcher recommends changes to the rubric should another researcher wish to use the rubric in future studies. (The recommendations can be found in Appendix C.) In RQ2, a limitation is that the researcher is only able to interview people who volunteer as participants. Another limitation for RQ2 is that the participants answer honestly so that the statements they share are a true reflection of their institution's assessment practices. In RQ3, a limitation is that the chosen statistical analyses will provide adequate results to answer the question. In RQ3, data from the Integrated Postsecondary Data System (IPEDS) was utilized[2]. IPEDS data was used due to ease of gathering. IPEDS does not require institutions to distinguish between CBE and non-CBE programs though. Thus, the researcher decided to find all the CBE programs the best she could in the United States via web search engines. The researcher then compared the search engine results and matched the programs up to the IPEDS programs. This was the best operational choice given that the data was from a secondary source; however, it could result in the capture of some inaccurate data should the programs not match up correctly. In addition, Western Governor's University is the only institution in the United States that is 100% competency-based as of the writing for this dissertation. Thus, when making comparisons of graduation rates and race/gender rates in CBE programs specifically, similar peer-institutions assigned by the National Center for Education Statistics (NCES) were utilized. Should different peer institutions be assigned in futures studies, results could vary because many variables besides CBE vs. non-CBE could affect the graduation rates

[2] See Definitions section of Chapter I to read about IPEDS.

and race/gender rates. Also in RQ3 as it relates to job placement, a limit is access to data. Data reviewed will only be from for-profit CBE degree programs and non-profit/public certificate programs that are mandated to participate in the Gainful Employment Rule [3]. Should for-profit institutions and non-profit/public certification programs have different job placement results than CBE programs from other types of institutions, the data may not be generalizable to all CBE programs. Finally in RQ3 as it relates to job placement, the Gainful Employment Rule does not require institutions to distinguish between CBE and non-CBE programs though. Thus, the researcher decided to find all the CBE programs the best she could in the United States via web search engines. The researcher then compared the search engine results and matched the programs up to the Gainful Employment Rule programs. This was the best operational choice given that the data was from a secondary source; however, it could result in the capture of some inaccurate data should the programs not match up correctly.

Delimitations

"Delimiters are the scope that you set on your research project, so it is not too large to complete; e.g., why you chose your aims, operationalization, and target populations" (Young, 2016, p.1). A couple delimitations exist in this study. In RQ1, Grant et al. (1979) is only one study that determines the reasons for CBE's past failures. Thus, it is only one interpretation. If more studies were reviewed, perhaps different results would occur. In RQ2, a delimiter is the number of participants in the study; it is anticipated that three qualitative interviews with three people working in CBE will provide enough data to analyze patterns of assessment practices in CBE programs. The

[3] See Definitions section of Chapter I to read about the Gainful Employment Rule.

number of interviews (three) was chosen to ensure the study was not too large to complete as well as to allow for the triangulation of data, should the results allow.

The assumptions, limitations, and delimitations in the three individual questions (RQ 1-3) can contribute to weaknesses in the study as a whole. As a reminder, all of the questions are related to the overall purpose, which is to evaluate whether CBE is likely to be successful this time. Should the assumptions, limitations, and delimitations lead to poor results, the researcher may inaccurately predict the likelihood of CBE failing again or being successful. Similarly, should the research questions not even correlate with CBE's failure/success to begin with, the study's phenomenological purpose may not have a strong research design. The top of Figure 4 illustrates the results of the research questions having a relationship with the success/failure of CBE (which is what the researcher is assuming), and the bottom of Figure 4 illustrates the results of the research questions not having any relationship with the success/failure of CBE.

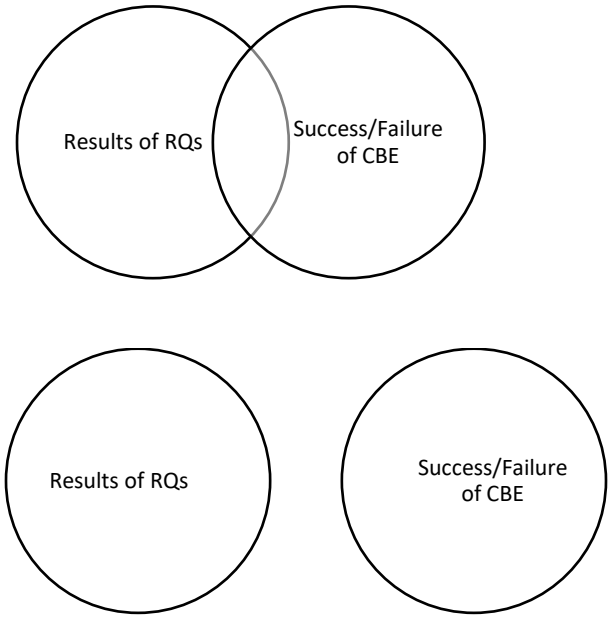

Figure 4. Results of RQs and Relationship to Success/Failure of CBE

Definitions

Listed below are definitions of terms that are used throughout this dissertation. Some terms have already been used in earlier pages of this document, while some will be used in later chapters.

Academic freedom: Academic freedom means that "teachers are entitled to freedom in the classroom in discussing their subject, but they should be careful not to introduce into their teaching controversial matter which has no relation to their subject" (AAUP, 1940, p. 1)

Adult learner (also referred to as non-traditional student): "Adult learners are a diverse group, typically age 25 and older, with a wide range of educational and cultural backgrounds, adult responsibilities, and job experiences. They typically do not follow the traditional pattern of enrolling in postsecondary education immediately after high school. They often return to school to stay competitive in the workplace or prepare for a career change. And they usually study on a part-time basis, taking one or two courses a term while maintaining work and family responsibilities" (Who Is the Adult Learner, n.d., p. 1).

Assessment: "Assessment for learning is the process of seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning" (Key Questions, 2002, p. 1).

Assumption: An assumption is "a statement that is presumed to be true, often only temporarily or for a specific purpose" (Wargo, 2015, p. 1).

Authentic Assessment: "Authentic assessments evaluate real-world competencies and the ability of students to perform in complex scenarios" (Everhart, 2014, p. 2).

Carnegie Unit: "The standard Carnegie Unit is defined as 120 hours of contact time with an instructor, which translates into one hour of instruction on a particular subject per day, five days a week, for twenty-four weeks annually" (Silva, Toch, & White, 2015, p. 8).

Chi-square statistic: "The chi-squared statistic is a single number that tells how much difference exists between the observed counts and the counts a researcher would expect if there were no relationship at all in the population" (Hopkins, 2017, p. 1).

Coaches: "Coaches in competency-based education maintain an advisory relationship with a student, typically throughout the student's enrollment in a competency-based education program. Coaches may also be called mentors or student success coaches." (Bush, Ganzglass, O'Brien, & Soares, 2014, p. 15).

Conceptual framework: A conceptual framework is "an argument about why the topic one wishes to study matters, and why the means proposed to study are appropriate and rigorous" (Ravitch & Riggan, 2014, p. 5).

Contingency table: A contingency table is "a table representing the cross-classification of two or more categorical variables. The levels of each variable are arranged in a grid, and the number/frequency of observations falling into each category is noted in the cells of the table" (Field, 2009, p. 783).

Competency: "A competency is a specific skill, knowledge, or ability that is both observable and measurable" (Bush, Ganzglass, O'Brien, & Soares, 2014, p. 5).

Competency-based education: "Competency-based education is a term used for programs that focus more on what students have learned, rather than where or how long the learning takes place. Instead of evaluating student progress primarily on the amount

of time spent in a classroom (using the credit hour, which is the default standard for measuring progress), students receive college credit based on their actual demonstration of skills learned" (Klein-Collins & Tate, 2015, p. 2).

Competency-Based Education Network (CBEN): "The Competency-Based Education Network is a group of colleges and universities working together to address shared challenges to designing, developing, and scaling competency-based degree programs" (About the Network, n.d., p. 1).

Course-based with credit equivalency model: The course-based with credit equivalency CBE model is set when institution's "academic teams translate competencies into topics that can be formulated into courses of the appropriate length and complexity" (Johnstone & Soares, 2014, p. 17).

Credit hour: "A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time" (Bush, Ganzglass, O'Brien, & Soares, 2014, p. 17).

Degree attainment: "Refers to the educational level of a state, country, or region's population" (Clarke, 2016, p. 12). "The attainment rate reflects the number of individuals in the population who have attained the degree or diploma. This differs from the graduation rate, which measures the number of individuals within a cohort who graduate

or complete their program within a certain amount of time" (Kanter, Ochoa, Nassif, & Chong, 2011, p. 12).

Delimitations: "Delimiters are the scope that you set on your research project, so it is not too large to complete; e.g., why you chose your aims, operationalization, and target populations" (Young, 2016, p.1).

Delphi method: "The Delphi technique is a widely used and accepted method for gathering data from respondents within their domain of expertise. The technique is designed as a group communication process which aims to achieve a convergence of opinion on a specific real-world issue. The Delphi process has been used in various fields of study such as program planning, needs assessment, policy determination, and resource utilization to develop a full range of alternatives, explore or expose underlying assumptions, as well as correlate judgments on a topic spanning a wide range of disciplines. The Delphi technique is well suited as a method for consensus-building." (Hsu and Sandford, 2007, p. 1).

*Digital badge*s: "Digital badges are an assessment and credentialing mechanism that is housed and managed online. Badges are designed to make visible and validate learning in both formal and informal settings, and hold the potential to help transform where and how learning is valued" (MacArthur Foundation, 2018, p. 1).

Direct assessment: "An instructional program that, in lieu of credit hours or clock hours as a measure of student learning, utilizes direct assessment of student learning" (Bush, Ganzglass, O'Brien, & Soares, 2014, p. 18).

Equity: "The terms equity and equality are sometimes used interchangeably, which can lead to confusion because while these concepts are related, there are also

important distinctions between them. Equity involves trying to understand underprivileged groups and give people what they need to enjoy full, healthy lives. Equality, in contrast, aims to ensure that everyone gets the same things in order to enjoy full, healthy lives. Like equity, equality aims to promote fairness and justice, but it can only work if everyone starts from the same place and needs the same things. Not everyone is equal. Once everyone enjoys a similar level of health and well-being, we can focus on preserving fairness by giving everyone the same things: this is equality" (SGBA, n.d., p. 1).

Evaluation: "A means to judge something with respect to its worth or significance" (Evaluate, n.d., p. 1).

For-profit college/school: "For-profit schools are educational institutions that are corporations and often have shareholders. They operate as a business and the product they sell is education. Their goal is to provide quality education and, in doing so, generate a positive return (or profit) for their shareholders" (Ashanti, n.d., p. 1).

Gainful employment: "To protect students at career colleges from becoming burdened by student loan debt they cannot repay, the U.S. Department of Education announced gainful employment regulations to ensure that these institutions improve their outcomes for students—or risk losing access to federal student aid. These regulations will hold career training programs accountable for putting their students on the path to success. To qualify for federal student aid, the law requires that most for-profit programs and certificate programs at private non-profit and public institutions prepare students for gainful employment in a recognized occupation. Under the regulations, a program would be considered to lead to gainful employment if the estimated annual loan payment of a

typical graduate does not exceed 20 percent of his or her discretionary income or 8 percent of his or her total earnings. Programs that exceed these levels would be at risk of losing their ability to participate in taxpayer-funded federal student aid programs" (Obama Administration Announces, 2014, p. 1).

Graduation rate: "Graduation rate **is** the percentage of a school's first-time, first-year undergraduate students who complete their program within 150% of the published time for the program. For example, for a four-year degree program, entering students who complete within six years are counted as graduates" (What are graduation, n.d., p. 1).

Integrated Postsecondary Education Data System (IPEDS): "IPEDS is a system of interrelated surveys conducted annually by the U.S. Department of Education's National Center for Education Statistics. IPEDS gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid programs. The Higher Education Act of 1965, as amended, requires that institutions that participate in federal student aid programs report data on enrollments, program completions, graduation rates, faculty and staff, finances, institutional prices, and student financial aid" (About IPEDS, n.d., p. 1).

Job market: "The job market is the market in which employers search for employees and employees search for jobs. The job market is not a physical place as much as a concept demonstrating the competition and interplay between different labor forces. The job market can grow or shrink depending on the labor demand and supply within the overall economy, specific industries, specific education levels, or specific job functions" (Job Market, 2010, p. 1).

Job placement rate: This definition varies by accrediting agency. For example, the Accrediting Commission of Career Schools and Colleges defines it as the "placement of students who graduated within 150% of normal completion time and are employed in field" (Sykes, 2011, p. 6). The Accrediting Council for Independent Colleges and Schools defines it as the "placement of students that complete or graduate a program during the reporting period (July 1- June 30) and have a job by September 15th" (Sykes, 2011, p. 6).

Learner-centered: "In learner-centered teaching, the focus is on the student as learner and on improving student learning and success, rather than on the transmission of information" (Learner-Centered Teaching, n.d., p. 1).

Liberal arts education: "Liberal arts education is an approach to learning that empowers individuals and prepares them to deal with complexity, diversity, and change. It provides students with broad knowledge of the wider world (e.g. science, culture, and society) as well as in-depth study of a specific area of interest" (What is a 21st Century Liberal Education, 2015, p. 1).

Limitations: "Limitations are potential research weaknesses that are mostly out of the researcher's control, impacting the interpretation of research findings, because of, e.g., research design, statistical constraints, and access to audiences or data" (Young, 2016a, p. 1).

Personalized learning: "Personalized learning refers to various aspects of educational delivery in which individualized and differentiated practices are emphasized. Personalized learning offers students choices in their learning activities, ways of engaging with their peers and mentors, and other options that emphasize the importance of the person in educational contexts" (Bush, Ganzglass, O'Brien, & Soares, 2014, p. 7).

Phenomenology: "The type of problem best suited for this form of research is one in which it is important to understand several individuals' common or shared experiences in order to develop practices or policies, or to develop a deeper understanding about the features of a phenomenon" (Creswell, 2007, p. 60).

Prior learning assessment: "Prior learning assessment (PLA) is the evaluation and assessment of an individual's life learning for college credit, certification, or advanced standing toward further education or training. PLA is often applied to military and work experience, as well as community service, informal online learning, and other learning acquired outside traditional academic institutions. PLA often uses evaluation of competency mastery to translate these learning experiences into college credits. These tests can be internally developed by the institution or can be standardized tests such as the College Level Examination Program (CLEP), Excelsior College Exams, or DANTES Subject Standardized Tests" (Bush, Ganzglass, O'Brien, & Soares, 2014, p. 11).

Quality standard: "A quality standard is a detail of the requirements, specifications, guidelines, and characteristics needed to be able to meet its quality by the product in order to meet the purpose of the product, process, or service" (Quality Standards Definition, n.d., p. 1).

Rubric: "Rubrics are assessment matrices with criteria for evaluating a competency and levels of demonstrated performance. Rubrics are applied to student work with the results used to determine levels of achievement. Rubrics are used to evaluate student, course, and program performance" (Bush, Ganzglass, O'Brien, & Soares, 2014, p. 9).

Seat time: "Seat time is often used in conjunction with credit hour, referring to time-based educational requirements measuring student time in classes. An institution that is offering asynchronous online courses would need to determine the amount of student work expected in each online course to achieve the course objectives, and to assign a credit hour based on at least an equivalent amount of work as represented in the definition of credit hour" (Bush, Ganzglass, O'Brien, & Soares, 2014, p. 19).

Self-paced learning: "Self-paced learning allows students to progress through learning materials and processes more quickly or more slowly on their own terms, including the ability to set their own deadlines and completion goals, generally without externally defined constraints" (Bush, Ganzglass, O'Brien, & Soares, 2014, p. 7).

Student learning outcomes: "Student learning outcomes are observable and measurable statements of what a student knows, thinks, or is able to do as a result of an educational experience. Sets of learning outcomes can be defined at the level of the institution, programs, courses, learning modules, or in other types of groupings" (Bush, Ganzglass, O'Brien, & Soares, 2014, p. 5).

Theoretical framework: A theoretical framework "presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting a phenomenon" (Anfara & Mertz, 2006, p. xiv).

Traditional education: "Traditional education is defined as teacher-centered delivery of instruction to classes of students who are the receivers of information" (Huson, 2016, p. 1).

Z-scores: Z-scores are the "value of an observation expressed in standard deviation units" (Field, 2009, p. 796). 95% of z-scores lie within -1.96 and 1.96 on a normal distribution (Field, 2009).

CHAPTER II – REVIEW OF RELATED LITERATURE

Review of the Gaps in the Literature

Chapter II will focus on detailing some of the larger gaps in the CBE literature. While there is some research published about CBE (see Appendix B), there are certainly some areas that lack empirical research. This chapter will focus on the three major gaps of empirical research.

Three Visible Gaps

First, there is research about why CBE failed in earlier years but little research on whether institutions are avoiding that failure this time around. Second, there is a large gap in the research of assessment. Many reports (Gaertner & McClarty, 2015; Johnstone & Soares, 2014; McDonald, 1976; Rowen, 2015) indicate that CBE programs must focus on assessment, and there are reports on specific programs and what they do for assessment (Borin, Metcalf, & Tietje, 2010; Dwyer, 2016; Holmboe et al., 2010); however, there has not been research on the inspection of assessment practices of CBE programs. Third, little empirical research on the outcomes (graduation, race/gender equity, and job placement) of CBE programs exists. Graduation and job placement rates have been studied by individual programs but not on a more comprehensive level. In addition, CBE's effects on equity and diversity have not been well researched, meaning a limited number of empirical articles display when searching for this topic. Without practical, empirical research on CBE, the effectiveness of this educational platform will remain speculative instead of documented by evidence.

Lassnigg (2015) also validated that these gaps in the literature exist, particularly as it relates to outcomes and effectiveness of CBE. Lassnigg (2015) studied the quantity

of literature that existed on CBE's effectiveness and found that articles were very limited. A summary of Lassnigg's (2015) methodology and findings are below:

> This paper is based on extensive search and review of literature of two kinds, (i) academic publications from *EBSCOHOST Education Research Complete*, and (ii) mixed user led practical, political, and scholarly material from *Google* and *Google Scholar*. The focus of the searches was on (CBE) effectiveness. The searches provided some basic patterns of the discourses around CBE. The incidence of publications shows an exponential increase, with a 'take-off' since the 1990s, and a slight increase of tackling with effectiveness or effects from about 10% of hits in the 1970s to about 30% of hits currently. The distinct time periods were identified with stepwise increases of the publication activity: (i) 1970s till 1994; (ii) 1995-2004; (iii) 2005-2010; (iv) 2011-2015. Since the 2000s the representation of 'effect…'shows a kind of cyclical pattern, with sharp increases in 2001, 2005, 2011 followed by some years of decline. Overall, about 16% of hits give some emphasis to issues of effectiveness, with an increase to almost 40% in the 2011-14 period. The closer inspection will show many meanings of effectiveness, and only few items that really tackle the effectiveness of CBE. (p. 10)

It is clear more research is needed on the quality and outcomes (thus, effectiveness) of CBE programs. This study seeks to add empirical research to some of the gaps in the literature through three research questions. First, a short review of the CBE landscape today as well as its history is provided.

The CBE Landscape Today

CBE has been around for many years (as explained later in this chapter); however, since 2014, it has gained more attention from U.S. policy makers. "In the summer of 2014, for example, the United States House of Representatives unanimously passed a bipartisan bill (HR 3136) that supported the development of CBE demonstration programs in up to 30 colleges and universities" (Kelchen, 2015, p. 1). Kelchen (2015) sought to create an inventory of CBE programs and identified 51 colleges with some form of CBE on their campus. One institution is entirely CBE (Western Governors University) while others have entire CBE-branches of their institution. Some institutions are largely traditional and offer just a few CBE programs. According to Kelchen (2015), "CBE institutions combined to enroll 143,166 undergraduate students and 57,492 graduate students in the fall of 2012" (p. 8). Table 1 was made from several sources including Kelchen (2015), Google searches, and the Competency-Based Education Network (Member Institutions, n.d.). For a summary of CBE programs in existence as of the publishing of this dissertation, see Table 1.

Table 1

Summary of CBE Programs

Institution	Type	Programs Offered
Alverno College	Private, non-profit	All undergraduate and graduate level programs are built around competencies

Table 1 (continued).

Anitoch University	Private, non-profit	MFA in Creative Writing and Ph.D. in Leadership and Change
Austin Community College	Public	Accelerated Programmer Training Certificate
Bellevue College	Public	Business Software Specialist Certificate
Brandman University	Private, non-profit	Bachelor of Business Administration
Broward College	Public	Associate of Science in Computer System Specialist
Capella University – FlexPath	Private, for-profit	BS in Accounting, Business Administration, Healthcare Management, Human Resource Management, Project Management, Management and Leadership, General Information Technology, Information Assurance and Security, IT Project Management, General Psychology, and Nursing; MBA in Accounting, Business Intelligence, Entrepreneurship, General Business Administration, Global Operations and Supply Chain Management, Health Care Management, Human Resource Management, and Project Management; Certificates in Business Intelligence, Business Management,

Table 1 (continued).		
		Entrepreneurship, Management Counseling, and Health Administration; MHA in General Health Administration; MS in General Information Systems and Technology Management, Project Management, Child and Adolescent Development, Educational Psychology, General Psychology, Industrial/Organizational Psychology, and Sport Psychology; and Minors (with BS degrees) in Network Technology with Cisco/Microsoft and System Development with Mobile/Web Application
Central New Mexico Community College	Public	Associate Degree in Business Administration and Associate Degree in Liberal Arts
City University of Seattle	Public	BA in Management; BS in Information Technology; Alternative route certificate to teacher certification; Master's in teaching degree; M.Ed. in Curriculum and Instruction; M.Ed. in Reading & Literacy; M.Ed. in Special Education; and M.Ed. in Adult Education
Concordia University	Private, non-profit	Master of Science in Education: Educational Design and Technology
Danville Community College	Public	Associate of Applied Science Technical Studies degree with an Industrial

Table 1 (continued).		
		Maintenance specialization; Associate of Applied Science in Integrated Systems Technology with two specialties: Electrical/Electronic or Mechanical Systems; Certificate Programs in Welding, IT, and Precision Machining Technology
Davenport University	Private, non-profit	Master of Business Administration and Executive Master of Business Administration
DePaul University	Private, non-profit	Master of Arts in Applied Professional Studies; Bachelor of Arts with an Individualized Focus Area; Bachelor of Arts in Computing; Bachelor of Arts in General Business; and Bachelor of Arts in Early Childhood Education.
Edmonds Community College	Public	Certificates in Technology and Integration Support, Web Developer, Data Management, Network Security, and Ethical Hacker
Excelsior College	Private, non-profit	Associate Degree in Nursing
Fielding Graduate University	Private, non-profit	EdD in Leadership for Change
Granite State College	Public	Non-degree continuing education units for teacher education; Non-degree programs including Foster

Table 1 (continued).		
		and Adoptive Care Essentials, Caregiver Ongoing Training, and Residential Counselor Core Training
Indiana University – Purdue University Indianapolis	Public	BS in Transdisciplinary Studies in Technology
Ivy Tech Community College of Indiana	Public	Certificate Programs in Business Operations, Applications, Technology, and Software Development
Kalamazoo Valley Community College	Public	Certificates in Electricity, Mechanical Systems, Integrated Information Technologies, and Automated Control Systems
Kentucky Community and Technical College System	Public	Each general education discipline is offered in CBE, as are business, nursing, and information technology programs
Lipscomb University	Private, non-profit	Bachelor of Professional Studies in Organizational Leadership
Lone Star College System	Public	Certificates in Information Technology and Oil/Gas, Associate of Applied Science, and Associate of Arts in Business
Lord Fairfax Community College – Knowledge to Work	Public	Associate of Applied Science Degrees in Health Information Management and in Information Systems Technology; and Certificates in Office

Table 1 (continued).		
		Systems Assistant, Hospital Facility Coding, Information Processing Technician, Cyber Security, Networking Specialist, Plumbing, Electrical, and HVAC
Los Angeles Trade – Technical College	Public	Certificates, Associate of Science, and Associate of Arts in wide-range of health programs
New Charter University	Private, for-profit	BS and MS in Education; AS, BS, and MS in Criminal Justice; Master of Public Administration; AS and BA in Communication; AS and BS in Business; Master of Business Administration; and Executive Master of Business Administration.
Northern Arizona University – Personalized Learning	Public	Bachelor's Degree in Management, Nursing, Computer Information Technology, Liberal Arts, or Small Business Administration
Patten University	Private, for-profit	Associate of Arts in General Studies with a concentration in Business or Criminal Justice; Bachelor of Arts in Leadership, Management, or Psychology; Masters of Business Administration
Rasmussen College – Flex Choice	Private, for-profit	Certificates, Diplomas, Associate's, Bachelor's and Master's degrees in Business, Design, Education, Health

Table 1 (continued).		Sciences, Justice Studies, Nursing, and Technology
Rio Salado College	Public	All certificates and associate degrees are competency-based
Salt Lake Community College	Public	Certificates in Business Office Technology, Computer and Networking Technology, Culinary Arts, Electronics Technology, Health Care Technology, Manufacturing Technology, Media and Web Design Technology, Professional Truck Driving, and Skilled Service Technology
Sinclair Community College – Sinclair Accelerate	Public	Certificates in Software Testing, Networking, System Administration, IT Fundamentals, Advanced Manufacturing, Unmanned Ariel Systems, and Retail Management
Southern New Hampshire University - College for America	Private, non-profit	Associate of Arts Degrees in Healthcare Management and General Studies; Bachelor of Arts Degrees in Management, Communications, and Healthcare Management
Southwestern College	Public	Master of Arts in Teaching
Spokane Falls Community College	Public	Certificates in Business, Software Applications, and Microsoft Office Specialist.

Table 1 (continued).

Texas A&M University – Commerce and South Texas College	Public	Bachelor of Applied Sciences in Organizational Leadership
Thomas Edison State College	Public	Bachelor of Arts in Psychology and Master of Business Administration
University of Georgia	Public	Bachelor of Arts Degree in Communication with a Civic Leadership Concentration, and a Graduate Credential for Georgia's K-5 educators seeking Mathematics and Science Certificate Endorsements
University of Louisville	Public	Bachelor of Science in Organizational Leadership and Learning with an emphasis in Healthcare Leadership
University of Maryland University College	Public	All undergraduate and graduate programs are competency-based
University of Michigan	Public	Master of Health Professions Education
University of New England	Public	Bachelor of Science in Health Informatics
University of Texas- Rio Grande	Public	Bachelor of Science in Biomedical Science
University of Texas System - Online	Public	Bachelor's degrees in engineering, information management, and business
University of Wisconsin – Flex Option	Public	Associate of Arts; Associate of Science;

Table 1 (continued).		
		Bachelor of Science Degrees in Nursing, Biomedical Sciences Diagnostic Imaging, Information Science and Technology, Business Administration; and Certificates in Business and Technical Communications, Project Management, and Substance Use Disorders Counseling
Valdosta State University – YOUSucceed	Public	K-5 Science Endorsement Program and K-5 Mathematics Endorsement Program
Valencia College	Public	Alternative Route Educator Preparation Certification Program
Walden University – Tempo Learning	Private, for-profit	Master of Science in Early Childhood Studies; Master of Business Administration; Master of Healthcare Administration; Graduate Certificate in Early Childhood Administration, Management, and Leadership; and Graduate Certificate in Applied Project Management
Western Governors University	Private, non-profit	All programs are (Bachelors, Masters, and Certificates) are competency-based
Western Kentucky University	Public	Bachelor of Science in Advanced Manufacturing

Table 1 (continued).

Westminster College	Private, non-profit	Master of Business Administration, Master of Strategic Communication, and Bachelor of Science in Nursing

In addition to these programs that already offer CBE, Fain (2015b) reports that roughly 600 institutions have begun to implement some sort of CBE program on their campuses. In a survey by Fusch (2016) of 261 of these 600 institutions, 51% were public, 42% private non-profit, and 7% private for-profit. Of those, 71% were 4-year institutions and 29% were 2-year colleges. Fusch (2016) stated that the survey indicated the following reasons for adopting CBE:

- 71% of colleges said they hoped it would expand opportunities for non-traditional students
- 55% hope it will improve learning outcomes and completion rates
- 54% want to better respond to workforce needs
- 41% want to enhance student employability
- 38% want to decrease tuition for non-traditional students
- 21% want to decrease tuition for all students. (p. 1)

Another survey asked institutions why they wanted to implement CBE, too. Garrett and Lurie (2016) reported these reasons:

- 68% of colleges said they hoped CBE would provide access to non-traditional learners

- 57% hoped CBE would improve degree completion
- 54% said they hoped CBE would better align to workforce needs than traditional education
- 54% said they wanted to be innovative
- 37% said they wanted to clarify their learning outcomes
- 22% said they wanted to be able to lower tuition for their students. (p. 12)

History of Competency-Based Education

Much of the literature on CBE tends to begin with a short summary of its history. Ford (2014) identified five generations of competency-based education in the United States and other researchers such as Nodine (2016) and Dailey (2016) identified more generations when viewed from an international standpoint.

The very first generation of CBE is thought to have come from Australia when, during the late 1800s, the application of scientific management to work-roles first appeared (Ford, 2015). Fredrick Taylor was the founder of scientific management and this time period became known as *Taylorism*. Taylor analyzed labor processes from an efficiency stand-point and sought to train workers on maintaining particular standards of industrialization (Drury, 1915). He thought that all work could be made scientific and meticulously streamlined through standardized operating procedures. Because of this hardened stance on the work environment, it led to some abuse of workers who did not meet the new expectations. While many view Taylorism negatively today due to Fredrick Taylor's treatment of workers (Lohr, 2014), Taylorism has remained influential to today's practices in work and education as there is a demand for high-productivity and tracking of positive outcomes (Ford, 2015).

The 1920s to late 1950s marked the second generation of CBE. Benjamin Bloom and John Carroll's mastery-based models of learning suggested students be given materials to master within their own time (Nodine, 2016), which is much like CBE's separation from the credit hour today. Bloom's taxonomy was also utilized during this time as a framework for competencies (Nodine, 2016). Hodge (2007) suggested that B.F. Skinner's operant conditioning and behavioral objectives also made an impact on CBE during this time. Finally, Dailey (2016) stated that the trade and vocational schools that developed for veterans returning home from World War II provided a demand for competencies and more structure in education.

The late 1960s to 1970s saw the third generation of CBE and it was during this time that the word *competency* came to be used as well (Nodine, 2016). The performance-based teacher education reform started this new form of CBE (Hodge, 2007). Instruction became modular (Nodine, 2016) and there were specific objectives of what teachers should be able to do that could be measured (Ford, 2015). Butova (2015) argued that education philosopher Noam Chomsky also played a role in the support for CBE when he "declared in 1965 a fundamental difference between the competence or knowledge of language, and the application or actual use of language" (p. 251).

The 1980s-1990s saw the fourth generation of CBE with former President Bill Clinton and former First Lady Hillary Clinton's push for standards-based education (Dailey, 2016). The publication *A Nation at Risk* fed this momentum because it contributed to the notion that American schools were failing and measurable criteria were needed to ensure it would not continue to fail (Dailey, 2016). *A Nation at Risk* is a 1983 report that started a movement of many more reports claiming education needed reform.

Finally, today's fifth generation of CBE has begun due to increased technological capabilities (Ford, 2015; Kevan, 2017) and globalization (Butova, 2015), and adult learners are the new student target (Ford, 2015). In this generation, former President Obama's call for increased access, affordability, and effectiveness in producing workers for future jobs is what provides the strongest argument for CBE (Dailey, 2016). Kevan (2017) also argued that the changing demographics of the nation, growing industry, public demands for quality, and the request for adaptive learning have all set the stage for a renewal of CBE as well.

Gap 1: Why the Past Failures of CBE?

Given the multiple generations of CBE, some have asked why CBE continues to fail. According to the literature, several arguments including its complexity, lack of superiority to traditional education, faculty resistance, lack of socialization for students, movement away from higher education's purpose, inability to measure the liberal arts, problems with business processes, fear of lower standards and opening of the flood gates, and a poor stigma of online education have negatively impacted the success of CBE.

Complexity

Klamen, Williams, Roberts, and Cianciolo (2016) argued that CBE has been a failure because learning is not linear and thus not all learning can be measured. They also stated that it is difficult for everyone to agree on competencies; thus, there is no consensus. Klamen, Williams, Roberts, and Cianciolo (2016) point to a couple of different times that CBE failed due to its complexity, particularly during the teacher education reform during the 1960s but also on institutional levels as well. For example, the Southern Illinois University School of Medicine CBE "curricular objectives of the

1976 curriculum was abandoned because there was not enough time to do all the assessment work needed and the program eventually collapsed under its own weight" (Klamen, Williams, Roberts, & Cianciolo, 2016, p. 906). Gallagher (2014) agreed about this complexity stating, "competencies tend to become more numbered and narrower over time, thereby shrinking the construct being taught and assessed" (p. 20). Albanese, Mejicano, Anderson, and Gruppen (2010) made several arguments about CBE's complexity, and they concluded that competencies are often too granular and that there could be a risk of competencies being eased in a detrimental way due to the need for measurement.

Superiority

Gallagher (2014) argued that CBE has yet to be proven superior to traditional education and, thus, unless that is done, it will continue to fail because change is difficult for organizations to make unless results are shown to be positive. The Association for Institutional Research stated that this comparison of superiority is needed to make the case for a CBE program (Soldner & Parsons, 2016).

Undermines Faculty and Faculty Resistance

Gallagher (2014) said that CBE undermines the professionalism of faculty "accelerating the casualization of academic labor" and is unsuccessful as a top-down approach to higher education (p. 20). In a report from the American Association of University Professors on Capitol Hill Day in June of 2016, the association wrote that they are against CBE because they feel it was only created to boost degree attainment when, according to them, degree attainment is less about academics and more about high tuition (Prior Learning Assessment, 2016). The AAUP (2016) said:

> Most students who don't complete their degrees fail to do so because of financial problems. Instead of inventing new gimmicks (like CBE), members of Congress should advocate for the restoration of the financial support that has been taken away from our colleges and universities. (p. 2)

Neem (2012) in an article called *A University Without Intellectuals: Western Governors University and the Academy's Future* also urged caution to competency-based education because it changes the faculty role from researcher to coach.

Socialization

Gallagher (2014) stated that CBE lacks peer discussion, and students who were involved in CBE in the 1970s stated that the lack of it in their CBE program was a disappointment. In a report by Räisänen and Räkköläinen (2009), the researchers mentioned that socialization is important in education because job performance evaluations often measure communication and social skills more than specific vocational skills.

Student Complaints

In research by Litwin (1976), he found that 40 students from eight different CBE programs cited the following reasons for being unsatisfied in their CBE program: motivation due to unstructured education, not enough contact with students, study habits hard to change, poor time management skills, not enough class credit given for the time it took to complete the module, procrastination, anxiety about assessments, not enough direction, and little institutional support.

Away from Higher Education's Purpose

Gallagher (2014) stated that the main reason CBE continues to fail is that it is too separated from the purpose of higher education to begin with, and that higher education is not just about the degree or diploma earned:

> When we define higher education in terms of credentialing learning anywhere, anytime, by any means, we are in danger of forgetting that our purpose is to provide students with richly educative experiences. Colleges and universities are not content-delivery mechanisms or credit brokers. They are places where people gather to learn together: to talk, to argue, to interpret, to analyze, to synthesize, to create, and to imagine. (p. 22)

In addition, Oyugi (2015) said that while CBE is responding to demands of higher education (lower cost, more consistent outcomes, etc.), CBE will likely never be able to solve the world's real problems which is what higher education seeks to do. Oyugi (2015) said:

> These are the problems that plague our world and our societies: environmental degradation, poverty, sustainability, equality, and health and wellness. These are issues that touch each and every one of us. These problems require innovative, comprehensive solutions. It is not possible to write a well-defined statement of the problem, as can be done with an ordinary problem. In this context, the issue of competency is difficult to define and measure. Since there is no clear definition of the problem, there is often no definite solution to the problems. (pp. 74-77)

Measurement of the Liberal Arts

Neem (2013), in the *Journal for the Association of American Colleges and Universities*, stated that the liberal arts experience takes place with seat time and

interaction, which is exactly what CBE does not offer. He stated that competencies cannot represent the true outcomes of a course or program and that, "ideally, a liberal education would instill in students the disposition to ask questions that they did not know were worth asking" (Neem, 2013, p. 29). Thus, this spontaneous critical thinking cannot be measured, and CBE is in direct contradiction of the liberal arts. Kim (2016) agreed that CBE is destroying the liberal arts and stated:

> A liberal arts education puts great value in the process of learning, not just the outcomes. Struggling with hard questions, ideally in the context of a relationship with an experienced and well-supported educator, is as important (if not more important) than coming up with the right answers. (p. 1)

Business Processes and Regulatory Environment

Many researchers have argued that federal financial aid, accreditation, and other regulatory requirements have made CBE difficult to implement and contributed to the demise of some programs. Lacey and Murray (2015) explained that current higher education policies stifle the growth of CBE; they recommended that federal and state laws become less tied to the credit hour as well as that mandatory standards for CBE be created. LeBlanc (2015) echoed their concern by stating that the disbursement of Title IV Aid and Satisfactory Academic Progress needed to be separated from the credit hour to support CBE. Easton (2015) surveyed 85 programmatic accrediting bodies of which 26 (30.5%) responded to the survey. Easton (2015) found that most programmatic (not institutional) accreditors are responding re-actively to CBE and not providing enough support for a framework.

Uranis (2017) wrote there are many business process barriers to overcome in CBE

including “recruitment, marketing, pre-admissions support, admissions, advising, orientation, registration, billing, programs of study, access to institutional resources, transcripts, and the maintenance of key performance indicators” (p. 92). These are barriers to CBE because they require new standard operating procedures. For example, in recruitment, admissions counselors must be able to explain what CBE is and encourage students to be interested in this new type of education. As another example, transcripts and grades are different. Because CBE is built around outcomes, not courses, the transcripts from student information systems must be re-programmed.

Fear of Low Standards and Opening of Flood Gates

Horohov (2017) stated that CBE could open the floodgates by focusing too much on social mobility and the job market, and not enough on higher education’s purpose of teaching civic duties. CBE may be the “result of social mobility overshadowing the other purposes of education, flooding the market too much to ensure social efficiency and dismissing democratic equality as irrelevant given the high stakes of the job market” (Horohov, 2017, p. 27). Other authors also recommended utilizing caution with CBE. Hill (2015) said, “we need to ensure due diligence in conducting a thoughtful analysis of all the current players’ programs and their graduates. Otherwise, this may not be just another educational fad, but the opening of the floodgates” (p. 1). Fain (2017a) also reported that there was a fear that CBE was lowering the standards of quality in higher education, and that graduates of these programs would suffer from the negative stigma.

Stigma of Online Education Programs

While online education has only been available for the last 15-20 years, many of the CBE programs of today are online. And, online education carries a negative stigma

that traditional education does not. A 2013 Gallup poll reported that only 34% of Americans could rate online education as good or excellent (Saad, Busteed, & Ogisi, 2013). "Americans tend to think online education provides less rigorous testing and grading, less qualified instructors, and has less credence with employers compared with a traditional, classroom-based education" (Saad, Busteed, & Ogisi, 2013, p. 1). Given that many of the CBE programs of today are online, this could create issues for CBE as well.

Opposing Views

With all these reasons for CBE's failure, there have been other reports that indicate its success. Ford (2014) wrote that CBE has been difficult to operationalize, but that the technology of today may better assist during this current generation of CBE. Santos, Dominquez, and LaFrance (2011) argued that while competencies are difficult to define, utilizing program advisory boards with subject matter experts helped in two case studies. Colson (2017) recognized that a lack of social interaction is a fault of CBE and suggested ways to increase student interaction in an online environment. In addition, some institutions which have implemented liberal arts classes into CBE have done so successfully; writing about these institutions, Benoist and Gibbons (1980) as well as Lowry (2014) argued that CBE and outcomes-based education strengthens the liberal arts. Woditsch (1976) stated that CBE faculty and traditional faculty want their students to leave their education institutions competent in many of the same ways (e.g.: in critical thinking skills and communication skills), but that CBE faculty simply want that competence measured as well. This may differentiate traditional faculty from CBE faculty.

Lack of Empirical Research

Most of the reports about the failure of CBE are not empirical; however, there is one that is. A book by Grant et al. (1979) entitled "*On Competence: A Critical Analysis of Competence-Based Reforms in Higher Education*" is a thorough, empirically-researched-based source. The book includes research articles about 12 different CBE programs at five institutions, and it was a $500,000 research project financed by the Fund for the Improvement of Postsecondary Education (FIPSE) under the U.S. Department of Education. The articles were collated to become a full 592 page book. RQ1 will utilize this research, and the reasons for past CBE failure according to Grant et al. (1979) can be found in Table 3 in Chapter 4.

Moving Forward

Despite the barriers to past generations of CBE, higher education institutions are moving forward with this educational platform. Gardner (2017) stated that higher education is doing so in line with contingency theory; as long as there are external pressures of survival, higher education will need to change. This time, however, there is a network that is designed to ensure support of CBE programs. The Competency-Based Education Network (CBEN), the professional association for institutions that offer CBE, created voluntary quality standards for institutions to follow when designing CBE programs. "A quality standard is a detail of the requirements, specifications, various guidelines, and characteristics needed to be able to meet its quality by the product (CBE) in order to meet the purpose of the product, process, or service (Social Problem from Chapter I)" (Quality Standards Definition, n.d., p. 1).The purpose of the CBEN standards was to define what a quality CBE program is, as well as to influence policymakers and accrediting bodies in their regulation of the field. The CBEN standards were released in

draft form in October 2016 and the final version was released in May 2017. There are eight standards:

1. Demonstrated Institutional Commitment to and Capacity for CBE Innovation
2. Clear, Measurable, Meaningful, and Integrated Competencies
3. Coherent Program and Curriculum Design
4. Credential-Level Assessment Strategy with Robust Implementation
5. Intentionally Designed and Engaged Learner Experience
6. Collaborative Engagement with External Partners
7. Transparency of Student Learning
8. Evidence-Driven Continuous Improvement

RQ1 of this study will focus on these standards and compare them to Grant et al. (1979) reasons for past failure.

About the First Part of the Study

The first part of the study seeks to determine whether, through the use of the CBEN (May 2017) standards, CBE will or will not fail during its current fifth generation. The method of analysis will include reviewing the reasons why it failed before according to the empirical articles by Grant et al. (1979), and whether or not those issues are being addressed in the current May 2017 CBEN standards. Based on the alignment, this research question seeks to determine whether the May 2017 CBEN standards will help CBE be successful and maintain vitality during this current generation of the educational pedagogy.

Theoretical Framework for the First Part of the Study

The theoretical framework for the first part of the study is Lewin's 3-Stage Theory of Change and Force Field Analysis. Lewin is often referred to as the father of social psychology and much of his work was about organizational development (Connelly, 2016a; Connelly, 2016b). A model of his 3-Stage Theory of Change can be viewed in Figure 5.

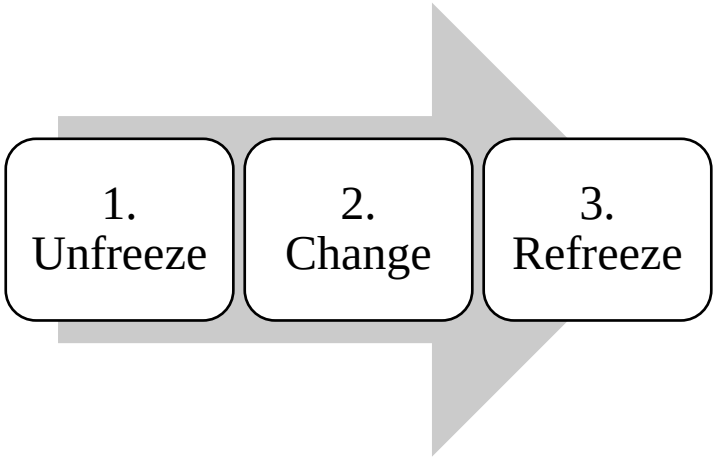

Figure 5. Lewin's 3-Stage Theory of Change

According to the theory explained by Connelly (2016a) and Kaminski (2011), essentially there is a pattern that is occurring and people have negative feelings or notions about it. The first stage is to unfreeze the pattern and look at its problems that are making people have negative feelings toward it. The second stage is to change the pattern based on those negative feelings. This helps the pattern move to a changed state. The third stage is to re-freeze the pattern, with changes, into something new that has a standard operating procedure. The standard operating procedure ensures that the problems do not re-occur, and that the new pattern can be re-reviewed by people without those earlier negative attributes.

A similar work of Lewin's is his Theory of Force Field Analysis. A model of the force field analysis can be seen in Figure 6.

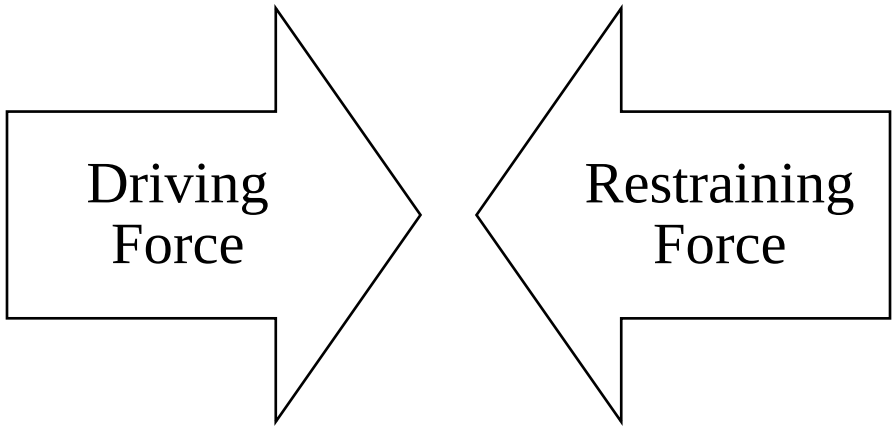

Figure 6. Lewin's Theory of Force Field Analysis

Imagine that in the middle of the two arrows is CBE. Some forces are driving its success while some forces are restraining it (Connelly, 2016b; Kaminski, 2011). In order for change to occur, one force must be stronger than the other. If the driving force for CBE to be successful is more powerful than the restraining force for CBE to fail, then, according to the theory, CBE will survive this generation. If the restraining force, which is acting as a restriction to the success of CBE, is more powerful, then the current fifth generation of CBE will fail much like in generations prior. For this question, the driving force is possibly effective CBEN standards and the restraining force are reasons for past failure of CBE. Other examples of driving forces of CBE may be legislation, funding, and positive student outcomes. Other examples of restraining forces of CBE may be faculty resistance, low graduation rates, and negative stigma.

Previous studies have utilized the theoretical frameworks of Lewin. Meltz, Herman, and Pillay (2014) used the theory to review why an education system in South Africa was not successful. Utilizing Lewin's Force Field Analysis, the researchers

recognized different belief systems within the school that were competing against one another. Lunenburg (2010) also utilized Lewin's Force Field Analysis to examine forces that resist change in educational settings. He identified the following forces for change: marketplace, government laws and regulations, technology, labor markets, economic changes, administrative processes, and people. He also identified the following forces that resist change including: uncertainty, concern over personal loss, group resistance, dependence, lack of trust in administration, awareness of the weaknesses in the proposal, and fear of change. Schriner et al. (2010) reported a case-study using Lewin's 3-Stage Theory of Change to create organizational change in a nursing program. A fast and significant increase in enrollment at one nursing college created administrative stress. Lewin's 3-Stage Theory Model was used to create organizational change and the researchers concluded that it helped increase efficiency in nursing resources used to support the enrollment. It particularly helped ensure faculty and administration collaborated, and then agreed to the changes by applying the unfreeze, change, and refreeze process. Plante (2015) used Lewin's Force Field Analysis to measure the driving and restraining forces of higher education as a commodity. He found that the driving forces are more powerful than the restraining ones, and higher education must change to find equilibrium. Finally, Witherly (2010) applied the Force Field Analysis theory in a case study of creating standards-based education at a federal U.S. agency to determine what forces were supporting the creation of standards in science curriculum and which forces were not supportive.

Lewin's theory of force field analysis will be used in RQ1 to determine if the CBEN standards (May 2017) driving CBE are strong enough to combat the restraining

forces: the reasons why CBE has failed in the past according to Grant et al (1979). Lewin's unfreeze, change, and re-freeze three-stage theory of change will also be used in RQ1. The researcher will determine if the new CBEN standards (May 2017) are acting as an appropriately re-freezed standardized operating procedure enough to ensure CBE's vitality today. These two theories are appropriate for RQ1 because they have been used in higher education before and help provide a framework to determine how change might be successful.

Research Question 1

In research question one (RQ1), the study seeks to determine whether the May 2017 quality standards released by CBEN will help to decrease the likelihood of CBE failing again. The variables of interest are derived from the empirical study by Grant et al. (1979) and the CBEN standards (May 2017).

Gap 2: Literature on Assessment Practices

As stated earlier in Chapter II, there are gaps in the literature on CBE. The first major gap was about why CBE had failed in the past. The second major gap was on the research of assessment practices in CBE programs. Many reports (Johnstone & Soares, 2014; McClarty & Gaertner, 2015; McDonald, 1976; Rowen, 2015) indicate that CBE programs must focus on assessment, and there are reports on specific programs and what they do for assessment (Borin, Metcalf, & Tietje, 2010; Dwyer, 2016; Holmboe et al., 2010); however, there has not been research on the inspection of assessment practices in CBE programs. This section of Chapter II seeks to provide some information on the assessment practices in CBE programs.

The two key features of a CBE program include the institutional agreement on 1) what their graduates should know (competencies) and 2) how their students can demonstrate they know it (assessment) (Bral & Cunningham, 2016; Van der Klink et al., 2007). In the area of literature on the assessment of CBE, there are two subsections: 1) best practices in assessment and 2) the faculty role in assessment. The following pages are a review of these subsections of the literature.

Best Practices in Assessment of CBE

The first subcategory of research on assessment of CBE is about best practices. Several authors have written about best-practices in assessment of CBE, and a listing of some of their key take-a-ways can be found in Table 2.

Table 2

Best Practices in Assessment of CBE

Best Practice Source	Quote from source indicating what the best practice is in CBE assessment
Rowen (2015)	"Competencies need to be specific and measurable" (p. 3).
McClarty and Gaertner (2015)	"CBE programs should clearly define their competencies and clearly link those competencies to material covered in their assessments."
DeMark (2016)	"At Western Governors University, teams of faculty, content experts, and assessment specialists are charged with developing, monitoring, and maintaining assessment quality" (p. 86).

Table 2 (continued).

DeMark (2016)	"The assessment teams also have access to psychometricians to pull and assess quantitative data in order to assure the reliability of assessments" (p. 86).
Mattison, Sculthorp, and Zacharias (2017)	"Are assessments… • Realistic in activity or context? • Performance-based • Cognitively-complex • Formative? Do students… • Have to defend their answer? • Have to collaborate with each other or faculty? Is the scoring… • Known or transparent to the student? • Multiple indicators • Mastery" (p. 191).
Assessing Courses and Programs (2016)	"The primary purpose of assessment is to improve students' learning and teachers' teaching as both respond to the information it provides" (p. 6).
Assessing Courses and Programs (2016)	"Assessments should cover knowledge, skill, and performance. Students should demonstrate they know these in different ways" (p. 10).
DeMark (2016)	"Assessment is current" (p. 87).
Mattison, Sculthorp, and Zacharias (2017)	"Complex constructs are difficult to define, and are often times recognized because evaluators say 'they know it when they see it'" (p. 195).
Holt and Perry (2011)	"The process must have transferrable results. When someone has been assessed within a particular organization, then the results will be recognized in that organization. But what happens when that person applies for a job in

Table 2 (continued).

	another company- are the same results still recognized?" (p. 38).
Holt and Perry (2011)	"The process must be repeatable. It may be desirable to have a competency assessment carried out every year. Once this has been done more than once, it is possible to then see the competency trend or the evolution over time. This evolution of competency is powerful and can demonstrate how a person's skills and abilities have changed over time" (p. 36).
Wiggins and McTighe (2008)	"Most people don't self-assess their proposed assessments against any design standards, and they often end up with invalid inferences" (p. 185).
DeMark (2016)	"Assessment scores are normally distributed" (p. 87).
DeMark (2016)	"Average number of attempts to pass is within an acceptable range" (p. 88).
McClarty and Gaertner (2015)	"Providing validity evidence based on test content means showing the relationships between test questions or tasks and the defined competencies" (p. 6).
Rowen (2015)	"Each competency must be measured more than one time and in more than one way (that is, multiple choice tests, papers, presentations, performance-based, real-world assessments, etc.)" (p. 5).
McClarty and Gaertner (2015)	"The processes students use to complete the assessment tasks must be an authentic" (p. 6).
McClarty and Gaertner (2015)	"While it seems preferable to assess clinical reasoning in a clinical setting, assessment designers must clearly describe how adequate reasoning skills are demonstrated in a test-taking scenario" (p. 7).

Table 2 (continued).

McClarty and Gaertner (2015)	"Relating performance on CBE assessments with performance in future courses or in the workplace—are crucial if CBE programs want employers to view their assessments and their competency thresholds as credible evidence of students' career readiness" (p. ii).
McClarty and Gaertner (2015)	"There are different ways to measure different types of reliability, including test-retest (where students take the same test form on different occasions), internal consistency (which measures the extent to which students respond similarly to items within a single test form), and inter-rater reliability (where two or more raters evaluate the same student performance on a test). Students should receive approximately the same score if they take a test multiple times, regardless of the test form administered or the raters scoring it" (p. 7).
Gunnell, Fowler, & Colaizzi (2016)	"The ability to reliably assess student performance consistently over a period of time is crucial in these programs. For CBE programs which require multiple faculty or rater evaluations due to large student enrollments, it is expected that the faculty or raters score the student responses similarly. The reliability of ratings is critical for CBE programs because the integrity of the program rests on students demonstrating the specific competencies within the curriculum" (p. 36).
Domaleski et al. (2015)	"Variability associated with tasks, raters, and occasions can be evaluated using generalizability methods; and the threats to generalizability can be ameliorated by ensuring that enough tasks are employed, and that rater accuracy and consistency are monitored" (p. 13).
McClarty and Gaertner (2015)	"Although many CBE programs report developing reliable and valid assessments,

Table 2 (continued).

	reliability statistics are rarely publicly documented" (p. 8).
Rowan (2015)	"Performance-based measures rarely have right and wrong answers. Instead, they are often projects that require subjective evaluation. Thus, strong rubrics and evaluator training are necessary to effectively measure student performance of these competencies" (p.6).
Assessing Courses and Programs (2016)	"Rubrics should have performance ratings and performance descriptions" (p. 12).
Rowan (2015)	"Strong rubrics also must be properly vetted to ensure that the descriptions are not ambiguous; that is, reviewers are interpreting the descriptions in exactly the same way each time" (p. 6).
Wiggins and McTighe (2008)	"It helps when students themselves identify the characteristics of an exemplary project so that they have a clearer understanding of the parts of the whole. This means exposing students to many student-generated and professional writing samples, guiding students to identify exactly what makes each a strong or weak writing piece, identifying the necessary skills, and teaching those skills. Students now have a map for each unit" (p. 176).
Wiggins and McTighe (2008)	"Faculty can re-define and refine rubrics based on student work" (p. 181).
Rowan (2015)	"Those reviewing students' work must be trained to properly use the rubrics. This training requires an explanation of the project, a review of each cell of the rubric, and sample projects for reviewers to evaluate in order to practice using the rubric. Training is a success when the rubric is performing consistently across reviewers of the same project, that is, a

Table 2 (continued).

	project is scored consistently across multiple reviewers" (p. 6).
Mattison, Sculthorp, and Zacharias (2017)	"There is debate on how accurately authentic assessments can be measured if the instructors doing the evaluating lack the necessary skill sets and training. Teachers' inadequate training and ill-preparation for assessment, particularly authentic assessment, is well known" (p. 199).
Quality Principles and Standards for Competency-Based Education Programs: Demonstrated Institutional Commitment To and Capacity for CBE Innovation (2017)	"At the initiation of a program, a traditional faculty and staff model is in place but new models that support student learning in a CBE program are articulated. Action steps toward this new model and/or specialized roles (e.g., assessment specialist, instructional designer, coach) have been outlined. Faculty and staff position descriptions reflect an intentional model designed to support the CBE student effectively. Faculty/staff identified for specialized roles are aware of and agree on their roles and responsibilities" (p. 7).
Mattison, Sculthorp, and Zacharias (2017)	"Faculty are not only responsible for evaluating learner competence, but also for providing the formative feedback necessary for learners' ultimate mastery of said competence" (p. 187).
Quality Principles and Standards for Competency-Based Education Programs: Credential-Level Assessment Strategy with Robust Implementation (2017)	"Faculty understand the faculty role in the overarching assessment strategy for the credential and are trained in and can articulate the critical role played by each assessment in validating mastery of a competency" (p. 17).
McClarty and Gaertner (2015)	"CBE programs must determine how well a student must perform on the assessment in order to demonstrate competency—in other words, what is the cut score that separates the competent from the not-yet-competent?" (p. 3).

Table 2 (continued).

Mattison, Sculthorp, and Zacharias (2017)	"The definition of mastery is a compilation of Bloom's Theory and concepts set forth by Guskey and Anderman" (p. 188).
McClarty and Gaertner (2015)	"In the case of CBE, the assessment cut scores distinguish those who receive credit (or various levels of credit) from those who do not. Because cut scores are central to the use and interpretation of CBE assessments, test designers must also gather validity evidence to support cut-score placement" (p. 4).
McClarty and Gaertner (2015)	"Empirical links (like job performance) should also be used in the standard-setting process so providers develop cut scores that truly differentiate masters from non-masters" (p. ii.)
Quality Principles and Standards for Competency-Based Education Programs: Credential-Level Assessment Strategy with Robust Implementation (2017)	"The assessment design accommodates personalization for learners by offering flexibility in when assessments will be administered, often supported by technology" (p. 17).
Quality Principles and Standards for Competency-Based Education Programs: Credential-Level Assessment Strategy with Robust Implementation (2017)	"The timeliness of feedback from assessments enables learners to proceed with the absolute minimum of delay. Technology is used wherever possible to facilitate and expedite the timeliness of feedback" (p. 17).
McClarty and Gaertner (2015)	"CBE programs should continue to collect and monitor graduates' life outcomes in order to provide evidence that a CBE credential stands for a level of rigor and preparation equivalent to a traditional postsecondary degree" (p. iii).
Domaleski et al. (2015)	"If a student is mistakenly advanced to the next learning target, teachers should quickly be able to discover and correct this error. Similarly, if a student is erroneously (or cautiously) held back from advancing to the next learning target, this error should become evident and corrected. There may be some loss

Table 2 (continued).

	of efficiency, but this loss is likely not very critical in the larger scheme" (p. 14).
Domaleski et al. (2015)	"Given that such assessments are likely to have a summative purpose, security and standardization of the assessments must be addressed. When a single or limited number of administrations are offered, a small number of standard forms should be developed and administered simultaneously to mitigate security concerns" (p. 6).
Domaleski et al. (2015)	"CBE assessments may be incorporated into larger accountability systems and used to serve policy aims" (p. 15).
Quality Principles and Standards for Competency-Based Education Programs: Credential-Level Assessment Strategy with Robust Implementation (2017)	"The assessment strategy and each of the assessments and their corresponding rubrics equitably measure learning outcomes across diverse student groups, while guarding against bias in formative and summative assessment" (p. 17).
DeMark (2016)	"Assessment is ADA compliant" (p. 87).
DeMark (2016)	"Assessment avoids bias and sensitivity issues" (p. 87).

Through the research for this study, it was found that only one institution that has CBE has a published rubric used to ensure their assessments are of high quality. Western Governors University was highlighted in an article by DeMark (2016). DeMark (2016) explained that:

The article presents two assessment quality rubrics that Western Governors University (WGU) has used effectively to guide the high-quality development and

maintenance of assessments across academic fields. The rubrics are offered to be of use to others in the field, specifically to assist CBE programs in establishing and maintaining high standards of assessment quality. (p. 1) The rubrics serve as another best practice in the literature.

The Faculty Role in Assessment

The second subcategory of research on assessment of CBE is about the faculty role in it. Mattison, Sculthorp, Schroeder, and Zacharias (2017) state that the faculty role in assessment is changing. The researchers mentioned that one of the biggest complaints about CBE is that some of the assessments are measured by someone only in charge of assessment. The reason for this is time and training. Authentic assessment takes much more time to review than standardized assessment. In addition, Master's degrees and PhD programs in which the faculty are educated often do not provide training on the complexities of assessment (Brinkman-Staneva, 2015). Thus, it is left to other professionals in the higher education institution that, while they are usually considered an instructor formally, their role and expertise are inherently different. The researchers stated that faculty must change to evolve with CBE. Nevertheless, the method of evaluation is evolving. Mattison, Sculthorp, Schroeder, & Zacharias (2017) explained how it is evolving:

> The future of higher education is moving beyond a focus solely on faculty judgment to include a more multi-dimensional evaluation strategy that involves peer and self-assessments, employer evaluations, real-world feedback from current practitioners in the field, and technology tools like smart tablets. (p. 203)

Bergeron (2016) discussed an audit of the Western Association of Schools and Colleges (WASC), the regional accrediting body for California, Hawaii, American Samoa, Guam, Federated States of Micronesia, Northern Marianas Islands, Palau, and Tokyo. The U.S. Department of Education reviewed whether WASC was properly reviewing their institutions with a standard required for Title IV funds. Bergeron (2016) explained:

> Under the Higher Education Act of 1965 (HEA), as amended, only students enrolled in an eligible program can receive financial aid and, except correspondence programs, those programs must be designed to ensure that there is regular and substantive interaction between students and instructors. (p. 115)

Through the audit, it was found that the Western accrediting body was not in compliance, particularly in relation to their CBE standards that regulate this rule. The reason they were not in compliance is because they did not require CBE programs to be coded differently than traditional programs and, thus, it was difficult to determine this compliance with the Higher Education Act of 1965. Bergeron (2016) explained the issue in detail and with an example, as written below:

> At the heart of every educational program is the relationship between faculty and students. It is, therefore, appropriate that the central question of whether a program is of adequate quality is how faculty interacts with students. As in many areas, accreditors leave it to institutions to determine who is considered instructional faculty, but state that instructional staff are responsible for the design, delivery, and assessment of academic programs. However, WASC does not require every faculty member to be engaged in all three aspects of the role of

instructional staff. As a result, some faculty could be responsible for design, others for delivery, and still another for assessment. Permitting faculty to have different roles is critical to the success of competency-based programs. This is particularly true with regard to assessment because CBE is critically linked to the assessment of the knowledge and skills acquired. Consider for a moment the approach taken by Western Governors University (WGU), which is not accredited by WASC but rather by the Northwest Commission on Colleges and Universities. WGU uses a mentoring approach to deliver its competency-based program. Each student is assigned a faculty member called a *student mentor* when they enroll. The student mentor is the primary point of contact throughout the student's program at WGU, helping the student set weekly study goals, guiding the student to learning materials, helping the student understand what is expected of them in each course, and providing needed motivation to the student. When starting a new course, the student mentor's efforts are augmented by a *course mentor* who is an expert on the content of the course and helps guide and answer questions as the student moves through the course. The course mentor communicates with the student through an online learning community and participates in live online discussions. The course mentor is also available to meet individually with students as they progress through the course. In addition to student and course mentors, WGU has other faculty members who are engaged in the *development* of academic programs, course materials, and assessments. They are also critical despite the fact that they are not engaged in regular and substantive interaction with students. Other institutions that have adopted competency-based approaches

> have similarly deconstructed the roles of faculty to gain from the growing expertise in key areas necessary for student success— mentoring, coaching, and assessment. The Department must decide whether the student mentors and course mentors are instructors as defined by the institution's accreditor and whether regular and substantive interaction between students and instructors is an integral part of the program and course design. (pp. 116-117)

According to Testa (2008) in an "article on the interplay between faculty as content experts and assessment staff as technical experts," WGU has 150 assessment evaluators because they review nearly 30,000 artifacts every month (p. 15). The Measuring College Learning Project and Resource Center (2016) is working to ensure faculty have a central role in defining learning goals and measures.

About the Second Part of the Study

As indicated in the previous pages, there are two main areas of research on assessment: best practices and the faculty role. Many reports (Johnstone & Soares, 2014; McClarty & Gaertner, 2015; Rowen, 2015; McDonald, 1976) indicate that CBE programs must focus on assessment, and there are reports on specific programs and what they do for assessment (Dwyer, 2016; Holmboe et al., 2010; Borin, Metcalf, & Tietje, 2010); however, there has not been research on the inspection of assessment practices of CBE programs. This part of the study seeks to inspect whether current CBE institutions are following best practices in assessment.

Theoretical Framework for the Second Part of the Study

The theoretical framework for the second part of the study is Bigg's Constructive Alignment Theory. This is a theory of teaching that recommends teachers build

curriculum with the outcomes first, and then design lessons and assessments around those outcomes (Biggs, n.d.). Using this theory, the outcomes must include a verb about something the student does to achieve an outcome (Biggs, n.d.). For example: the student will analyze, the student will develop, the student will construct, and more.

In a search of *constructive alignment theory* and *competency-based education* using ERIC and EBSCOhost educational research databases, zero results display. However, in a search of only *constructive alignment theory*, articles about outcomes-based education, competence, and authentic assessment display.

In a case study by Pretourius, Bailey, and Miles (2013), assessment tasks of a Midwifery program were reorganized using constructive alignment theory. The new assessment was scenario-based according to what would be an expected competency of a midwife after graduation from the Midwifery program. After the assessment was completed, students and staff were surveyed regarding their experience with the old and new assessments. The researchers found that respondents viewed the new assessment as more relevant to clinical practice.

In a different study using this theory, Botma, Rensburg, Coetzee, and Heyns (2015) developed a conceptual framework for modular learning. Constructive alignment was used in its development to ensure the skills taught in the modules were transferable to multiple contexts. The researchers built their conceptual framework through an expert review qualitative study and illustrated it via four steps. The steps of the proposed conceptual framework for modular learning include "activation of existing knowledge, engaging with new information, demonstrating competence, and application in the real world" (Botma, Rensburg, Coetzee, & Heyns, 2015, p. 499).

In a final study, Yang (2009) suggested using constructive alignment in interdisciplinary courses, particularly for technical programs with general education courses. For example, a nursing program might include a class on statistics. The statistics class, according to Yang (2009), should be created with the end in mind. Yang (2009) recommended that the interdisciplinary class be built around the two following questions to be more relevant to the students: "(a) What are the reasons for including interdisciplinary subjects in the curriculum of the program in the first place? and (b) What outcomes of learning should students achieve by taking the interdisciplinary subject?" (p. 601). By doing this, Yang (2009) suggested the class will have a more relevant focus and the students will be more engaged as well as understand why the class is important for their careers.

This theory is appropriate for Research Question 2 because it provides a framework to determine how assessment practices are made and aligned to outcomes, which is the guiding premise of a CBE program.

Research Question 2

In research question two (RQ2), the study seeks to determine what the policies and procedures are for assessment in CBE programs. The variables of interest are best practices (as detailed in Table 2) and the institution's assessment processes.

Gap 3: Literature on CBE Outcomes

A final gap in the literature on CBE is its outcomes, including the program's ability to graduate students and ensure those graduates get jobs while boosting degree attainment for underserved populations (non-white; females). These outcomes are the benefits of CBE, as argued by advocates for it (Ganzglass, Bird, & Prince, 2011; Krauss,

2017). Despite the advocacy, CBE's effects on equity and diversity have not been well researched as a limited number of empirical articles display when searching for this topic. Further, graduation and job placement rates have been studied by individual programs but not on a more comprehensive level. This final section of Chapter II seeks to review the literature that does exist on CBE outcomes.

There are three important outcomes of CBE: graduation, job placement, and equity. These outcomes address some of the social problems discussed in Chapter I. Degree attainment is not increasing as fast as the population is growing (West, 2012). It is also not increasing as fast as is needed for occupations of the future (Perna, n.d.) with 80% of jobs needing some form of higher education (Morrison, 2017). And, there are statistically significant differences in the attainment of higher education among racial groupings (Ryan & Bauman, 2016).

Graduation Rates

One of the strongest arguments about CBE is that can provide an avenue to boost degree attainment; however, only two empirical studies were found that address this claim. In a study of one junior college, Konkoth (2016) found no statistically significant difference in graduation rates of traditional students and CBE students; however, she did find other interesting information about graduation. With a sample size of 3,536 undergraduate students, the researcher analyzed graduation data of students from the two groups (CBE and non-CBE) using a binary logistic regression. Konkoth (2016) controlled for age, race, and gender and found the following information about demographics and their graduation performance in a CBE program. Konkoth (2016) explained the findings:

> An increase in age was associated with an increase in the odds of graduation. Females were more likely to graduate than males. Examination of the individual categories of ethnicity revealed that Black or African-American students had reduced odds of graduating compared to White students. Similarly, Hispanics had reduced odds of graduating compared to White students. Students of two or more races had reduced odds of graduating compared to White students. (p. 69)

Parsons, Mason, and Solder (2016) found that "completion rates of students in CBE programs ranged from 15% of 80%, which is 2 to 10 percentage points higher than their traditional comparison groups" (p. 10). In addition, these researchers found that retention was higher for CBE programs as well.

Job Placement

In addition to graduation, another major argument to adopt CBE is due to its ability to train and then place students into careers. Few related studies exist. In a study of one junior college, Konkoth (2016) found that CBE students were more likely to be placed into jobs than traditional students from the same program. Konkoth (2016) stated that this could be because many of the CBE-students were already employed and that the CBE program was used for promotion, not initial job placement. Rivers and Sebesta (2017) surveyed graduates of a traditional program at Texas A&M University Commerce and a CBE program at Texas A&M University Commerce in which 101 students were surveyed. Roughly 90% were employed from both programs (Rivers and Sebesta, 2017). About 40% in both groups received an increase in income after graduation, with the CBE students getting a promotion while the traditional students found work at a new employer (Rivers and Sebesta, 2017). Morrison (2015) studied who enrolled in direct-assessment

CBE programs. Morrison (2015) found that 80% of enrollees only enrolled in the program because their employer suggested it. This leads into the next outcome, equity.

Equity

In addition to graduation and job placement, another major reason to adopt CBE is due to its ability to provide an educational framework which is more equitable than traditional education (Tedesco, Opertti, & Amadio, 2014). "Proponents see its potential to be part of an improved educational system that leads to quicker attainment of quality credentials, job placement, and career success for all" (Expanding Competency Based Education for all Learners, 2016). But, CBE could also be an issue in terms of equity because it only promotes those who already have employment. Lewis et al. (2014) explained:

> In a system where students have to demonstrate skills and knowledge to move forward, there might well be a rich get richer and poor get poorer effect: those whose backgrounds afford them a richer array of learning environments and who begin school already having acquired more skills may keep increasing the distance between themselves and their less fortunate peers. (p. 1)

Kamenetz (2013) reported that some higher education professionals feel as though CBE presents a gap in quality compared to traditional education, too. Kamenetz (2013) reported:

> It's a red flag to me, the idea that this is going to be more personalized, more flexible, and more accountable to the consumer. If you are from a lower socioeconomic status, you have this new option that appears to cost less than a traditional bachelor's degree, but it's not the same product. I see it as a really

> diminished higher education experience for less money, and yet disguised as this notion of greater access. (p. 2)

As detailed in Chapter I, research indicates there are significant gaps in degree attainment by race (Mitchem & Mortenson, 2017; Ross et al., 2012). One of the arguments for CBE is that, due to its flexibility and being less expensive, more people from various demographics could complete the programs. Not all reports agree with this notion.

A report by the Joint Center for Political Studies (1980) provided information about what makes an education framework equitable so people can distinguish whether particular CBE programs are setting up inputs and processes for equitable outcomes. Rogers (2016) who is President of a University that offers CBE states that their program is best for mid-career professionals who have a financial support system, that which is not often found in low-income families. Cole, Coffey, and Goldman (1999) argued that formative assessment in K-12 (similar to what is done in CBE) can help in terms of equity because teachers and able to provide more personalized intervention and help. Manset and Washburn (2000) argued the opposite, stating that minimum competency examinations have more negative effects than positive ones in K-12. Girardi and Crew (2016) recognized that CBE only serves a select population and so they provided a framework to encourage programs to become more equitable: “If designed with the needs of a broader range of learners in mind, CBE could be an important piece of the national movement to increase educational access, equity, and credential attainment” (p. 5). Barrett (2017) stated that “over the last 30 years, the percentage of low-income high school students pursuing a degree immediately after graduation has almost doubled” but

that those students are attending institutions viewed as less prestigious than high-income families. Ward (2016) believed CBE could further stratify the higher education system by class more than traditional education.

In terms of numbers, Kelchen (2016) found that CBE institutions "vary in the racial, ethnic, and gender diversity" of their students. Reviewing nine CBE institutions, Kelchen (2016) found the following data:

> 65% percent of undergraduate students at the nine campuses are white, 20% are black, 9% are Hispanic, and 2% are Asian. This is slightly different from the nationwide enrollment by race, which is 60% white, 15% black, 15% Hispanic, and 6% Asian. Black students are overrepresented at CBE institutions, whereas Hispanic and Asian students are underrepresented. (p. 52)

In addition, he found that only 10% of students in CBE were less than 25 years old. "About 39% of students were between 25 and 34 years of age, 40% were between 35 and 49 years of age, and 11% were older than 50" (p. 52). Kelchen (2016) also reviewed methods of payment to determine income diversity stating that "5% of Excelsior students and 12% of Thomas Edison students received Pell Grants, compared to 42% of Western Governors and 44% of Capella students" (p. 53). Western Governors University is 100% CBE and Capella University has an entire branch campus for CBE. Kelchen (2016) utilized the United States Department of Education Integrated Postsecondary Education Data System (IPEDS) to gather this data. IPEDS are surveys conducted by the National Center for Education Statistics (NCES), and it is required that U.S. colleges and universities participate in the survey in order to receive Title IX funds for student financial aid. He said that he was only able to review nine institutions because, currently,

IPEDS does not separate between CBE branches and their institution as a whole. For example, a researcher cannot separate Northern Arizona University from its CBE branch (Kelchen, 2016). The nine institutions Kelchen (2016) choose to review were highly CBE, but not fully CBE. Thus, there are limitations to his study.

Having said this, in another study of a CBE program, Cleary and Breathnach (2017) found positive results. An adult learning program in Dublin, Ireland that offers CBE had graduation rates double the national average in the United States and was able to confer degrees for more non-traditional students. The researchers stated that the institution's commitment to this purpose must be at the forefront to ensure success.

About the Third Part of the Study

The third part of the study seeks to review CBE's effectiveness by reporting on student outcomes including graduation (RQ 3.1), race/gender equity (RQ 3.2), and job placement (RQ 3.3) compared to the same student outcomes from similar, traditional programs.

Theoretical Framework for the Third Part of the Study

The theoretical framework for the third part of the study is Christensen's theory of disruptive innovation. The theory is market-based. According to the Christensen (1997):

> The theory explains the phenomenon by which an innovation transforms an existing market or sector by introducing simplicity, convenience, accessibility, and affordability where complication and high cost are the status quo. Initially, a disruptive innovation is formed in a niche market that may appear unattractive or inconsequential to industry incumbents, but eventually the new product or idea completely redefines the industry. (p. 1)

Many studies have used Christensen's theory of disruptive innovation as a theoretical framework, including a couple of studies on CBE. Dunagan (2017) published two case studies of the University of Wisconsin's Flex Option and Southern New Hampshire University's College for America and found that both innovative programs have made disruptive progress at the local or state level and have the possibility of disrupting the higher education system as a whole, particularly for adult learners. Christensen as well as researcher Weise (2014) believe CBE can disrupt the higher education system for many reasons, but one including that it allows students who are not attending higher education an avenue to enroll to due to its flexibility. In a qualitative, exploratory study of the CBE landscape, Mallett (2016) found CBE programs to be consistent with the theory of disruptive innovation. Flavin (2012) studied the theory via survey as it relates to technologies in higher education. He found that the theory could stand because students prefer technologies that are less expensive and easy to use. Soares (2012) compared CBE to Christensen's disruptive theory as it relates to several elements needed for disruption: technology, change in business model, new value network, and standards. When doing this comparison to determine whether these elements were present in CBE, Soares (2012) found that CBE does have the potential (as long as administrators and policy makers support it) to disrupt the higher education system as it is today.

Christensen's theory of disruptive innovation will be used to determine if the outcomes promised by CBE to address the social problems (degree attainment growth, degrees for the jobs of the future, and differences in education levels by racial/gender groupings) explained earlier in Chapter I are better as compared to traditional programs. If the data show that CBE is more successful in meeting these outcomes than traditional

programs, the theory is that CBE will eventually replace (i.e. disrupt) traditional forms of higher education due to its innovative technique in solving societal problems. This theory is appropriate for RQ3 because the researcher seeks to determine whether CBE programs are meeting the outcomes they claim to make. If they do not, it could be difficult to conclude that CBE is disrupting higher education.

Research Question 3

In research question three (RQ3), the study seeks to review CBE's effectiveness by reporting on student outcomes including graduation (RQ 3.1), race/gender equity (RQ 3.2), and job placement (RQ 3.3) compared to the same student outcomes from similar traditional programs. An institution that offers a traditional computer science program, for example, will be compared to a peer-institution that offers a CBE computer science program. Data from IPEDS will be used for RQ 3.1 and RQ 3.2, and data from the Gainful Employment rule will be utilized for RQ 3.3. Gainful Employment is a rule that requires for-profit institutions and non-degree programs at non-profit and public institutions to report their graduate's income six-months post-graduation. This income is then compared to their student loan debt to determine a debt-to-income ratio. The rule was initiated by former President Obama, and the purpose was to ensure that colleges are not overcharging in tuition. It was also to ensure that graduates of these programs can obtain the jobs they were trained for and at a salary where they can adequately pay back their student loans.

Conceptual Framework for Research Questions 1-3

Ravitch and Riggan (2014) define a conceptual framework as "an argument about why the topic one wishes to study matters, and why the means proposed to study is are

appropriate and rigorous" (p. 5). This is different than a theoretical framework that "presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting a phenomenon" (Anfara & Mertz, 2006, p. xiv). The conceptual framework for this study is explained in this section.

The topic matters because without practical, empirical research on CBE, the effectiveness of this educational platform will remain speculative instead of being guided by evidence. The means of the proposed study is phenomenology. According to Lichtman (2010), "the purpose of phenomenology is to describe and understand the essence of lived experiences of individuals who have experienced a particular phenomenon" (p. 75). Creswell (2007) described the type of study that is best suited for phenomenology stating:

> The type of problem best suited for this form of research is one in which it is important to understand several individuals' common or shared experiences in order to develop practices or policies, or to develop a deeper understanding about the features of a phenomenon. (p. 60)

This is an appropriate and rigorous means for the study because all the questions seek to better understand CBE's features as well as its vitality. RQ1 reviews its history to evaluate whether the same mistakes CBE made in the past will continue today. RQ2 reviews assessment practices of CBE programs which are critical to ensure quality. And, RQ3 reviews the outcomes of CBE to determine whether the promises of the educational platform have come to fruition. All these questions contribute to CBE's ability to remain a vital part of the higher education market today.

Figure 7 illustrates the conceptualization of the study. The middle of the diagram will indicate where best practices align with reality, while the outliers in Circle B will

indicate where institutions can do better in terms of 1) ensuring their CBE programs do not fail like they did in the past, 2) ensuring their assessment practices are quality, and 3) reviewing whether the outcomes of the program are aligning with intent. By reviewing the results of this study, higher education professionals will be able to develop practices or policies to better ensure the effectiveness of competency-based education. It may also help administrators decide whether or not they should develop CBE programs.

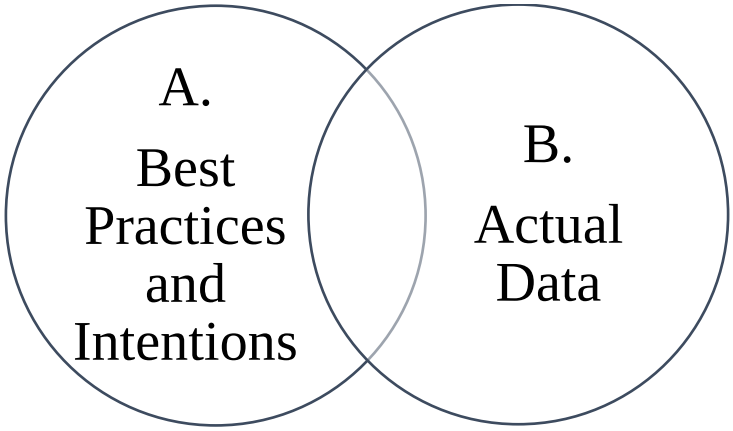

Figure 7. Conceptual Framework

Summary of Literature Review

Three gaps in the literature were identified and discussed. The first gap was about CBE's history and threats to its future success as an educational platform. The second gap was about CBE's best practices in assessment. The third gap was about outcomes of CBE programs including graduation, race/gender equity, and job placement.

This dissertation seeks to add empirical research to the field as it relates to these three gaps. In research question one (RQ1), the study seeks to determine whether the May 2017 quality standards released by CBEN will help to decrease the likelihood of CBE failing again. The variables of interest are the empirical study (turned book) by Grant et al. (1979) and the CBEN standards (May 2017). In research question two (RQ2), the

study seeks to determine what the policies and procedures are for assessment in CBE programs, and to see whether several institutions are aligning with best practices or not. The variables of interest are the best practices in Table 2 and the institution's assessment processes. In research question three (RQ3), the study seeks to review CBE's effectiveness by reporting on student outcomes including graduation (RQ 3.1), race/gender equity (RQ 3.2), and job placement (RQ 3.3) compared to the same student outcomes from similar, traditional programs.

While each question has its own theoretical framework, the study shares one conceptual framework which is a phenomenology. By reviewing the results of this study, higher education professionals will be able to develop practices or policies to better ensure the effectiveness of competency-based education. It may also help administrators decide whether they should develop CBE programs or not.

CHAPTER III - METHODOLOGY

Introduction to Methodology

The measurement of three different questions required three methods. The methods were a rubric-based assessment, qualitative interview, and a quantitative statistical analysis. While there were three different questions with three methods, all of the questions were related to the overall purpose which was to evaluate whether CBE was likely to be successful in this fifth generation. For the purposes of this dissertation, success will be defined as two or more research questions having positive or successful results. Failure will be defined as fewer than two research questions having positive or successful results. If fewer than two research questions have positive/successive results, CBE is not likely to be successful in this fifth generation; but, if two or more research questions have positive results, CBE is likely to be successful in this fifth generation.

Methodology for Research Question 1

In RQ1, the study sought to determine whether the May 2017 quality standards released by CBEN would help to decrease the likelihood of CBE failing again. The method used to answer this question was a rubric-based assessment. The researcher reviewed a compilation of empirical studies (made into a book) by Grant et al (1979) on why CBE failed initially, and then compared the reasons why it failed to the May 2017 CBEN standards to see if those reasons were addressed. The researcher assessed whether the May 2017 CBEN standards were effectively addressing these obstacles, so the likelihood of failure would be minimized. The empirical study (turned book) reviewed was by Grant et al. (1979) and entitled “On Competence: A Critical Analysis of

Competence-Based Reforms in Higher Education." The variables of interest were derived from the empirical study by Grant et al. (1979) and the May 2017 CBEN standards.

The procedure for review was through a researcher-designed rubric. The rubric was made from the Grant et al. (1979) study. The rubric was tested for validity according to the recommendations from Moskal and Leydens (2000), as well as Dr. Lance Tomei from the Council for the Accreditation of Educator Preparation (CAEP) and LiveText. To ensure construct, criterion, and face validity, several higher education faculty members who also served as a Directors of Assessment and, through their positions, designed rubrics for colleges were asked for their input on the rubric's construct, criterion, and face validity. In addition, the rubric was compared to a book report on Grant's 1979 work; in 1980, Gordon had written a review of Grant's 1979 work and this review was used for content validity. To ensure reliability, the researcher for this dissertation employed another researcher to review Grant et al.'s (1979) work compared to the standards. A blind comparison was done to test for inter-rater reliability. The hypothesis for research question one (RQ1-H1) was that there would be areas of concern that Grant et al. (1979) discussed, and that not all of them would be addressed in the CBEN standards.

Methodology for Research Question 2

In RQ2, the study sought to determine what the policies and procedures were for assessment in several CBE programs in order to determine whether these CBE programs were aligning with best practices. The variables of interest were the best practices in assessment, as detailed in Chapter II Table 2, and the institution's assessment processes.

The method used to answer this question was qualitative. The researcher interviewed several Directors of CBE (or similar titles) at institutions that offer

competency-based education programs. The questions for the interview revolved around the best practices from Table 2. The researcher sought to understand where institutions align and do not align with best practices as it relates to performing assessments. Because of this, the qualitative interviews also served as an evaluation. The approach to the evaluation was decision-oriented so, as a benefit to those participating in the study, the employees at the CBE schools could see how they might adjust their programs to achieve alignment to best practices. It was also expertise-oriented because the standards (one of the best practices) created by CBEN were written and designed by expert administrators of longstanding CBE programs. All evaluation practices were in accordance with Program Evaluation: Alternative Approaches and Practical Guidelines written by Fitzpatrick, Sanders, and Worthen (2011). All qualitative research practices were in accordance with Qualitative Research in Practice written by Merriam (2002). The hypothesis for research question two (RQ2-H1) was that the assessment procedures would follow many but not all best practices.

Methodology for Research Question 3

In RQ3, the study sought to review CBE's effectiveness by reporting on student outcomes including graduation (RQ 3.1), race/gender equity (RQ 3.2), and job success (RQ 3.3) compared to the same student outcomes from similar, traditional programs. The method used to answer this research question was quantitative.

For graduation (RQ 3.1), the researcher gathered data from IPEDS. Data collected for IPEDS is vast; however, the portion used for RQ 3.1 included only information on graduation rates. Because competency-based education is a form of pedagogy, not an academic program, CBE programs are not uniquely coded in IPEDS. In addition, not all

institutions are 100% competency-based, except for Western Governors University (WGU). Thus, graduation rates of WGU were compared to similar peer-institutions, as defined and automated by NCES. A statistical analysis was not performed for RQ 3.1; instead, the information was simply reported via percentages and ranking. Those with a higher ranking meant the institution was graduating more students than their peers. Those with a lower ranking meant the institution was not graduating as many students as their peers.

For race and gender equity (RQ 3.2), the researcher provided a similar review to that of RQ 3.1. The researcher gathered data from IPEDS. The race/gender statistics of WGU were compared to similar peer-institutions, as defined and automated by NCES. A statistical analysis was not performed for RQ 3.2; instead, the information was simply reported via ranking. Those with a higher ranking meant the institution was graduating more students from historically underprivileged backgrounds (i.e.: non-white; females) than their peers. Those with a lower ranking meant the institution was not graduating as many students from underprivileged backgrounds their peers.

For job placement information (RQ 3.3), the researcher reviewed Gainful Employment Data from the U.S. Department of Education. The Gainful Employment data lists programs as to whether they passed or failed the Gainful Employment rule. The Gainful Employment data "determines whether a gainful employment program prepares students for gainful employment in a recognized occupation. A debt-to-earnings rate is based on the typical loan debt and earnings of a cohort of the program's former students who completed the program" (Gainful Employment Information, n.d.). Each program is listed as to whether it passes or fails this measurement. "Annual earning rates of less than

or equal to 8% are considered passing rates. Annual earning rates greater than 8% but less than or equal to 12% are zone rates, and annual earnings rates greater than 12% are failing rates" (Gainful Employment Information, n.d.). Those on the border of pass/fail are put into a zoning status. A chi-square test for independence was run to test for association between the two categorical variables (program: CBE and not CBE) and (Gainful Employment Score: pass, zone, fail).

The hypothesis for research question three was that graduation statistics (RQ 3.1-H1) would be about the same as traditional programs, but that race/gender equity (RQ 3.2-H1) and job placement (RQ 3.3-H1) would be higher in CBE programs than traditional ones.

Conceptual Framework Revisited

As stated in Chapter II, the means of the proposed study was a phenomenology. This was an appropriate and rigorous means for the study because all the questions (RQ 1-3) sought to better understand CBE's features as well as its vitality as an educational model in today's higher education market. RQ1 reviewed its history to determine whether the same mistakes CBE made in the past could continue today. RQ2 reviewed assessment practices of CBE programs which are critical to ensure quality. And, RQ3 reviewed the outcomes of CBE to measure whether the promises of the educational platform had come to fruition.

Summary of Methodology

While measuring the three different questions required three proposed methods, all the questions were related to the overall purpose, which was to evaluate whether CBE was likely to be successful during this current fifth generation of the educational

pedagogy's usage. Chapter IV took this overall purpose into account during the analysis of the results, as did Chapter V during the discussion.

CHAPTER IV – RESULTS

Introduction to Results

All the questions in this dissertation were related to the overall purpose, which was to evaluate whether CBE was likely to be successful during this current generation of the educational platform. For the purposes of this dissertation, success was defined as two or more research questions having positive or successful results. Failure was defined as fewer than two research questions having positive or successful results. If the results indicated failure, then CBE was less likely to have be successful this time around.

In RQ1, the study sought to determine whether the May 2017 quality standards released by CBEN would help to decrease the likelihood of CBE failing again (according to the reasons for past failure cited in Grant et al. (1979)). In RQ2, the study sought to determine what the policies and procedures are for assessment in CBE programs, and to see whether several institutions are following best practices in assessment. And, in RQ3, the study sought to review CBE's effectiveness by reporting on student outcomes including graduation (RQ 3.1), race/gender equity (RQ 3.2), and job placement (RQ 3.3) compared to the same student outcomes from similar, traditional programs. Measuring three different questions required three different methods. Results of this study are organized according to question with a summary at the completion of the chapter.

Results of Research Question 1

In RQ1, the study sought to determine whether the May 2017 quality standards released by CBEN would help to decrease the likelihood of CBE failing again. The

researcher reviewed an empirical collection of articles-turned-book by Grant et al. (1979) on why CBE failed before, and then compared the reasons why it failed to the May 2017 CBEN standards to see if those reasons were addressed in the standards.

The CBEN standards were released in May 2017 and can be found in Appendix C. It should be noted that only the May 2017 CBEN standards were reviewed and although a rubric for each standard exists, those rubrics were not reviewed as part of this process for RQ1. The method used to answer RQ1 was a rubric developed based on the work of Grant et al. (1979). The researcher read the Grant et al. (1979) book and then created the rubric based on the reasons for past CBE failures. The indicators of the rubric are based on Grant et al. (1979) research. The researcher for this dissertation sought to determine whether the CBEN standards (May 2017) would help to decrease the likelihood of CBE failing again, as defined by Grant et al (1979), via the rubric instrument.

The rubric was tested for reliability and validity according to the recommendations from Moskal and Leydens (2000) as well as Tomei (2017). To ensure validity, three higher education administrators who also serve as Directors of Assessments (or similar title) at their institutions and, through their positions, design rubrics for colleges were asked for their input on the rubric's construct, criterion, and face validity. Their input is summarized in the bullets below:

- Make each score descriptor different for each indicator and write them as positive statements rather than negative ones.

- Label the scores 1, 2, and 3 so the reader knows 1 is the lowest and 3 is the highest.
- Change some score descriptors.
- Make grammatical edits.
- Change confusing indicators.
- Edit some indicators which are double or triple barreled.
- Edit the placement of some indicators in a component to be moved to a different component.
- The rubric was formatted for the reviewer to write in their score (1, 2, or 3). Reviewer suggested the instructions state to circle the score because if a reviewer writes it in, they could put 2.5 which would not be a valid response.
- Remove any anthropomorphic qualities from the rubric. Thus, the following indicators were removed from the rubric despite them being reasons for past CBE program failures according to Grant et al (1979). Because these anthropomorphic qualities were removed, the rubric does not fully align with the reasons for CBE failure according to Grant et al. (1979).
    - At most institutions, CBE was implemented to combat economic hardship and low enrollment. Thus, there was already negativity at the institution.
    - Expectations and promises of CBE were high. Programs ought to promise cautiously to ensure continued support despite challenges.
    - Faculty viewed any educational innovation away from the traditional, selective schools as a diminishment of rigor.

- Faculty felt exposed because lesson plans and tests were reviewed prior to use. Faculty were also annoyed with the feeling of accountability.
- Faculty felt threatened if their students could not pass their class. There was pressure to produce competent students.
- Long-standing colleges had a hard time influencing faculty and staff to change their way of thinking. Many employees said, “we’ve always done it that way.”
- Faculty feared automation when their job would no longer be needed.
- Faculty resisted consultants brought in to help with the initial planning of CBE.
- CBE must watch for too forceful of leadership during implementation, which contributed to negativity at several institutions.
- Since CBE is a flexible program, attendance is not mandatory. This made faculty worried that students would think it is okay to not report to work either upon graduation.
- Students pacing themselves more slowly than their peers felt pressure to move faster.
- Students had anxiety about summative assessments and often delayed them because of it.

For content validity, the rubric was compared to a book report on Grant et al. (1979) work; in 1980, Gordon wrote a review of Grant et al. (1979) work, and this review

was used for content validity as well. The rubric was compared to Gordon's (1980) review to ensure no reasons for past failure were missed.

The CBE programs that Grant et al. (1979) studied no longer exist except for the one at Alverno College. The CBE programs that Grant studied were at the following institutions: Alverno College, The College for Human Services, Mt. Hood Community College, Florida State University, and Grand Valley State College. The finalized rubric had 13 components. These components contributed to the demise of the programs Grant et al. (1979) studied. The components included problems with 1) conceptions by multiple stakeholders, 2) faculty, 3) staff/administration, 4) pedagogy, 5) rubrics, 6) competencies, 7) assessments, 8) student services, 9) students, 10) diversity, 11) administrative/business processes, 12) outcomes, and 13) transparency. Each component had multiple indicators for a total of 87 indicators (as found in Table 3). Three-points were allotted to each indicator; therefore, the maximum number of points that could be scored on the three-point scale with 87 indicators was 261. Thus, a score of 261 equaled 100% alignment between the CBEN (May 2017) standards and Grant et al. (1979) reasons for past failure.

Once the rubric was finalized, the researcher completed the review. The researcher's comparison of the May 2017 CBEN standards to the Grant et al (1979) study via the rubric instrument can be found in Table 3 under the "Researcher 1 Result" column. Researcher 1 results yielded a score of 176/261 to equal a 67.4% alignment between the May 2017 CBEN standards and Grant et al. (1979) reasons for past failure.

To ensure reliability, the researcher employed another researcher to apply the rubric as well. A blind comparison was done to test for inter-rater reliability. The researchers scores were the exact same for 68 indicators or 78% of the total 87 indicators.

Results of this second researcher's comparison can be found in Table 3 under the "Researcher 2 Results" column. Researcher 2 results yielded a score of 159/261 to equal a 60.9% alignment between the May 2017 CBEN standards and Grant et al. (1979) reasons for past failure. Thus, there was a 6.5% difference between the results of Researcher 1 (67.4%) and the results of Researcher 2 (60.9%). The final average score was a 64.2% alignment, with the distance from the mean being 3.25 for Researcher 1 and -3.25 for Researcher 2. Using an academic grading scale from the United States, the 64.2% mean alignment score was equal to a D letter grade and indicated that the CBEN standards (May 2017) and Grant et al. (1979) work were not well aligned. Thus, the May 2017 quality standards released by CBEN will not help to decrease the likelihood of CBE failing again as defined by Grant et al. (1979). The hypothesis for research question one (RQ1-H1) was that there would be areas of concern that Grant et al. (1979) discussed, and that not all of them would be addressed in the CBEN standards. Based on these results, RQ1-HI was correct.

Table 3 *RQ 1 Rubric Instrument and Results*

		Instrument				Researcher 1 Results		Researcher 2 Results	
Component	Indicator	Reasons for CBE Failure and/or Lessons Learned, According to Grant et al. (1979) Study (Turned Book)	3 Target	2 Developing	1 Unsatisfactory	Score	If 2 or 3 was selected, in which part(s) of the standards is this addressed?	Score	If 2 or 3 was selected, in which part(s) of the standards is this addressed?
#1 Issues with Conceptions	1.1	The institution must be completely sold on the idea of CBE or else conversations at committee meetings kept going back to "why are we doing this" instead of moving forward with development and implementation. CBE must be fully approved by faculty and administration governance systems because the politics at the institution affected some of the program's success.	Standard requires CBE be formally approved through the institution's shared governance system and align with institutional mission.	Standard requires CBE either be approved through the institution's shared governance system or be aligned to the institutional mission.	Standard does not detail how institutions should approve of CBE prior to its implementation, nor does it state that it must align with the institutional mission.	2	1A	2	1A

Table 3 (continued).

	1.2	There was concern over the institution's identity and how it would be perceived by the public and alumni, particularly whether people would feel as though the institution was less prestigious with CBE.	Standard requires institution to educate alumni about CBE and use follow-up communications to garner support.	Standard requires institution to educate alumni about CBE.	Standard does not require institution to educate alumni about CBE.	1	-	1	-
#2 Issues with Faculty	2.1	Faculty had to re-think their role in relation to students. Faculty no longer distributed knowledge; they facilitated learning and acted as a mentor and coach to their students. CBE changes the job description of faculty, and therefore requires buy-in.	Standard requires institutions to change the job description of their faculty to align with the needs of CBE using a faculty-committee to create the new description.	Standard requires institutions to change the job description of their faculty to align with the needs of CBE.	Standard does not require institutions to change the job description of their faculty to align with the needs of CBE. Standard also does not require using a faculty-committee to create the new description.	3	1C	3	1C and 5A
	2.2	A plan is needed for recruiting CBE faculty.	Standard requires institutions use a new mechanism (which includes a training program for interested people) to recruit faculty to CBE.	Standard requires institutions use a new mechanism to recruit faculty to CBE.	Standard does not require institutions use any new mechanism to recruit faculty to CBE.	1	-	1	-
	2.3	A plan is also needed for relieving CBE faculty should they not adopt the pedagogy.	Standard requires institutions include whether or not a faculty is a team-player or not on their annual performance review, and uses that information if needed to relieve a faculty member from their role.	Standard requires institutions include whether or not a faculty is a team-player or not on their annual performance review.	Standard does not require institutions include whether or not a faculty is a team-player or not on their annual performance review.	2	5C	2	5C

Table 3 (continued).

2.4	More faculty responsibility required more expensive salaries or an unpopular transition to increased use of faculty adjuncts. Administrators should allow release time from normal faculty responsibilities, especially during the initial development of CBE programs.	Standards require institutions do all 3 of the following: increase faculty salaries, do not hire adjuncts in replace of faculty, and provide release time during the development of CBE.	Standards require institutions do 1-2 of the following: increase faculty salaries, do not hire adjuncts in replace of faculty, and provide release time during the development of CBE.	Standards does not require institutions do any of the following: increase faculty salaries, do not hire adjuncts in replace of faculty, and provide release time during the development of CBE.	1	-	1	-
2.5	In programs without the faculty role dispersed into separate roles (student services, assessment, and teacher), the faculty and students had a lot of interaction. It was a strain on faculty trying to get other parts of their jobs done.	Standards require institutions disperse roles, so they can realistically be completed and are meaningful to the student.	Standards require institutions disperse roles, so they can realistically be completed.	Standards do not require institutions disperse roles, so they can realistically be completed.	3	5A and 5B	2	5B
2.6	Faculty often did not want to spend time creating CBE, as that service does not align with their tenure and promotion guidelines.	Standard requires institutions adjust their tenure and promotion guidelines to align with the needs of CBE. Standard requires institutions do this for both current and newly hired tenure-track faculty.	Standard requires institutions adjust their tenure and promotion guidelines to align with the needs of CBE.	Standard does not require institutions adjust their tenure and promotion guidelines to align with the needs of CBE.	1	-	1	-

Table 3 (continued).

	2.7	CBE attacked academic freedom and faculty felt they were losing control of the curriculum.	Standard requires institution to have a policy on academic freedom that establishes responsibility and expectations of faculty as it relates to their role in the classroom. Policy must specifically mention CBE.	Standard requires institution to have a policy on academic freedom that establishes responsibility and expectations of faculty as it relates to their role in the classroom.	Standard does not require institutions to have a policy on academic freedom that establishes responsibility and expectations of faculty as it relates to their role in the classroom.	3	1B	1	-
	2.8	Faculty had difficulty stating their outcomes. Faculty must be able to articulate their course competencies and assessment so students do not complain that the faculty does not understand CBE themselves and cannot answer student's questions.	Standard requires faculty can state the outcomes of their courses as well as the assessments designed to measure those outcomes.	Standard requires faculty can state the outcomes of their courses.	Standard does not require that faculty can state the outcomes of their courses.	3	4E	3	4E
	2.9	Faculty felt threatened because outcomes and competencies in CBE were decided not only by the faculty but also potential employers, advisory groups, and even students.	Standard requires institution have policy regarding stakeholder involvement in the program that outlines responsibilities of the different parties.	Standard requires institution have policy regarding stakeholder involvement in the program.	Standard does not require that institutions have a policy about stakeholder involvement in the program.	3	6A	3	6A-F
	2.10	CBE did not work for all types of faculty-personalities. Some faculty were structured in their teaching while others are not. Furthermore, technical mastery is high in CBE.	Standard requires a broad range of faculty with varying levels of technological and assessment expertise can thrive in CBE, and has a training plan for technical mastery.	Standard requires a broad range of faculty with varying levels of technological or assessment expertise can thrive in CBE.	Standard does not require a broad range of faculty with varying levels of technological or assessment expertise can thrive in CBE.	1	-	2	5A and 5G

Table 3 (continued).

2.11	New faculty lacked training on what CBE is and how to teach to this new pedagogy. These new faculty must also be activists for the pedagogy before hiring or else they could eventually vote it out.	Standard requires institutions train new faculty on CBE. Institutional faculty must also be able to stay the positive reasons for CBE.	Standard requires institutions train new faculty on CBE. Institutional faculty must also be able to stay the positive reasons for CBE.	Standard does not require institutions to train new faculty on CBE.	1	-	1	-
2.12	An emotional and intellectual interdependence was needed among faculty. Faculty must recognize that, despite program of study or vocational goal, many of the outcomes the institution wants students to obtain are the same.	Standard requires institution to require their faculty to intermingle with other departments besides their own, particularly in a setting about student learning outcomes.	Standard requires institution to require their faculty to intermingle with other departments.	Standard does not require institutions to require their faculty to intermingle with other departments.	1	-	2	6B
2.13	Administrators must be careful of faculty bitterness and morale, particularly during the planning/development phase. Many institutions experienced high drama.	Standard requires institutions to have a pro-active plan in the case that faculty morale decreases.	Standard requires institutions to have a plan in the case that faculty morale decreases.	Standard does not require institutions to have a plan in the case that faculty morale decreases.	1	-	1	-
2.14	Faculty turn over in CBE is high.	Standard requires institutions to track reasons for faculty turn-over via a survey or another method, and then use that data to better the work environment for faculty.	Standard requires institutions to track reasons for faculty turn-over via a survey or another method.	Standard does not require institutions track reasons for faculty turn-over via a survey or another method.	1	-	1	-

Table 3 (continued).

#3 Issues with Staff and Administration	3.1	Staff must be trained on what CBE is, particularly admissions staff that are responsible for communicating that information to prospective students. Some institutions did not recruit the large batch of students they had hoped to.	Standard requires institutions to train their staff on what CBE is, and then test their knowledge of the pedagogy to ensure they can communicate it.	Standard requires institutions to train their staff on what CBE is.	Standard does not require institutions to train their staff on what CBE is.	1	-	1	-
	3.2	Programs must have succession plans as many CBE programs are led by just a few people. When those people leave the institution, the initiative became short-lived. The turn-over rate of the person leading the CBE innovation is high. Having a core group of leaders is important in the case that this happens.	Standards require that institutions have succession plans should the person leading CBE resign. In addition, standards require that institutions have a committee of administrators to ensure multiple leaders, not just one.	Standards require that institutions have succession plans should the person leading CBE resign. OR Standards require that institutions have a committee of administrators to ensure multiple leaders, not just one.	Standards do not require that institutions have succession plans should the person leading CBE resign. Standards also do not require that institutions have a committee of administrators to ensure multiple leaders, not just one.	1	-	1	-
	3.3	CBE must have the full support of the administration, as it required many resources to be successful.	Standard requires institutions to have full support of the administration and board, including a listing in the institution's strategic plan.	Standard requires institutions to have full support of the administration and board.	Standard does not require institutions to have full support of the administration and board.	2	1A	2	1A, 1D, and 1F
#4 Issues with Pedagogy	4.1	CBE was time consuming and required a lot of planning in advance. There was a lot of specificity and detail.	Standard requires institution provide adequate resources to develop CBE including the use of technology to ease in process creation.	Standard requires institution provide adequate resources to develop CBE.	Standard does not require institution provide adequate resources to develop CBE.	1	-	1	-

Table 3 (continued).

	4.2	CBE was more costly than traditional education due to the human resources required to run a successful program. In addition, slow student progress in programs meant low credit generation and low full-time enrollment (FTE) numbers, which is a standard measure for many regulatory requirements. CBE completion rates were low and not cost effective for the institution.	Standard requires institutions create a business model to ensure success of CBE.	Standard requires institutions create a business model.	Standard does not require institutions create a business model.	3	1F	2	1F
	4.3	CBE was too pragmatic. It was difficult to maintain creativity. CBE is against wholeness because it works by defining the details that make up the whole. Human knowledge is global, integrated, and tacit.	Standard requires institutions find a healthy balance between theory and practice in their CBE programs, and justify when each is appropriate.	Standard requires institutions find a healthy balance between theory and practice in their CBE programs.	Standard does not require institutions find a healthy balance between theory and practice in their CBE programs.	2	2A	2	2A
	4.4	Long lists of measurements and specific behaviors took over the curriculum and were overwhelming.	Standard requires lists of measurements and specific behaviors be managed electronically to ease process in implementing CBE. Standard further requires that the Director of Institutional Research on campus use item response theory to test whether each behavior is needed to measure each time.	Standard requires lists of measurements and specific behaviors be managed electronically to ease process in implementing CBE.	Standard does not require lists of measurements and specific behaviors be managed electronically to ease process in implementing CBE.	2	5G	2	1G and 5G

Table 3 (continued).

	4.5	CBE was difficult to operationalize. Often those who planned the program were not teachers. Implementers rarely had the same skills or interests as those that initiated the program.	Standard requires that those planning the CBE program are also teachers. Standard further requires that those planning the program have varying levels of technical expertise and teaching styles.	Standard requires that those planning the CBE program are also teachers.	Standard does not require that those planning the CBE program are also teachers.	2	2B and 3E	2	6A
	4.6	Sometimes the first time a faculty teaches a traditional class, it is the first time they have seen the material themselves. In this case, the outcomes would be discovered as the semester goes. This did not work as well with CBE because faculty must declare outcomes (and assessments) in advance. Thus, students complained about lack of organization.	Standard requires that the entire class be built prior to the start of the semester.	Standard requires that the most but not the entire class be built prior to the start of the semester.	Standard does not require that the class be built prior to the start of the semester.	1	-	1	-
	4.7	When creating a CBE program, institutions should run them parallel to their traditional program for a control/ experimental group comparison.	Standard requires institutions run CBE programs parallel to their traditional programs for a control/ experimental group comparison. Standard also requires that comparison information be published for research purposes.	Standard requires institutions run CBE programs parallel to their traditional programs for a control/ experimental group comparison.	Standard does not require institutions run CBE programs parallel to their traditional programs for a control/ experimental group comparison.	1	-	1	-

Table 3 (continued).

#5 Issues with Rubrics	5.1	Not all CBE programs had rubrics, but they needed to. CBE assessments must be criterion-referenced, not norm-referenced.	Standard requires that 100% of assessments use a rubric.	Standard requires most assessments use a rubric.	Standard does not require assessments use a rubric.	3	4D	2	4D
	5.2	Students needed to be able to view assessment rubrics in advance. When students know the rubric, they assess themselves better and are more self-conscious.	Standard requires that institutions allow their students to view rubrics in advance, and encourages them to assess themselves prior to turning in an assignment.	Standard requires that institutions allow their students to view rubrics in advance.	Standard does not require that institutions allow their students to view rubrics in advance.	1	-	1	-
	5.3	Institutions had difficulty deciding on who makes the rubric.	Standards require rubrics be made and approved by a committee.	Standards require rubrics be made and approved.	Standards do not require rubrics be made and approved.	3	4F	1	-
	5.4	Institutions needed multiple assessors to use with the rubrics for inter-rater reliability, which was expensive.	Standards require that a sample of their assessments have multiple reviewers, and the institution has a budget and/or release time policy to cover this additional work.	Standards require that a sample of their assessments have multiple reviewers.	Standards do not require that any of their assessments have multiple reviewers.	1	-	1	-
#6 Issues with Competencies	6.1	Faculty could not agree on the selection of competencies. They feared their subject would get cut since the curriculum is aligned to outcomes, not courses. This was particularly true when there were no professional standards to map them to and when the cognitive styles of the faculty were different.	Standard requires institutions have their competency committees made up of an equal amount of faculty from different divisions of the institution to ensure representation. Standard further requires that competencies be approved by the full faculty.	Standard requires institutions have their competency committees made up of an equal amount of faculty from different divisions of the institution to ensure representation.	Standard does not require institutions have their competency committees made up of an equal amount of faculty from different divisions of the institution to ensure representation.	3	3C	2	3C and 4F

Table 3 (continued).

	6.2	Competencies must be transferrable to multiple types of programs or careers for any influence.	Standard requires that competencies can be used in multiple settings. Standard requires this be considered during program creation.	Standard requires that competencies can be used in multiple settings.	Standard does not require that competencies can be used in multiple settings.	3	4C	3	3A and 4C
	6.3	CBE competencies should be built around Bloom's taxonomy or another type of scientific learning mechanism, or else they could ignore some different ways of thinking.	Standard requires all competencies be built around Bloom's taxonomy or another type of scientific learning mechanism.	Standard requires some competencies be built around Bloom's taxonomy or another type of scientific learning mechanism.	Standard does not require competencies be built around Bloom's taxonomy or another type of scientific learning mechanism.	3	2E	3	2E
	6.4	Competencies must be built with the outcome (or program product behaviors) in mind, or else programs could be diluted.	Standard requires that institutions build their programs with the outcome in mind, and show how those outcomes are mapped to competencies and then mapped to assessments.	Standard requires that institutions build their programs with the outcome in mind.	Standard does not require that institutions build their programs with the outcome in mind.	3	2A	2	3A
	6.5	Particularly for vocational programs, the institution must have partnerships with practitioners in the community and those practitioners should be involved in defining competencies to ensure relevance to employers.	Standard requires institutions have formal partnerships with external practitioners, and that they use this feedback to make improvements to the program to ensure relevance to employer needs.	Standard requires institutions have formal partnerships with external practitioners.	Standard does not require institutions have formal partnerships with external practitioners.	3	2B, 2C, 6D, and 8C	3	2B and 6A-F

Table 3 (continued).

	6.6	Competencies must be measured, but at the same time programs must not restrict themselves to only what can be measured and therefore lower the intellectual content of the curriculum.	Standard requires measurement but also encourage institutions to develop and research new ways to measure previously-unmeasured tasks and/or behaviors.	Standard require measurement.	Standard does not require measurement.	2	2A	2	4C and 4F
	6.7	Competencies must be defined by degree (Bachelors, Masters, etc.).	Standard requires institution defined their competencies by degree, and uses the Lumina Degree Qualifications Profile (or another national standard) to assist.	Standard requires institution defined their competencies by degree.	Standard does not require institution defined their competencies by degree.	3	2E	3	2E
#7 Issues with Assessment	7.1	CBE cannot measure liberal arts when liberal arts means 'knowledge pursued for its own sake' and there are no defined, tangible outcomes. Deep, non-vocational outcomes were difficult to assess (for example: virtue, growth, morals, and tolerance for ambiguity).	Standard requires institutions research ways to measure deep, non-vocational outcomes and provide that research to the greater CBE community of institutions.	Standard requires institutions research ways to measure deep, non-vocational outcomes.	Standard does not require institutions to research ways to measure deep, non-vocational outcomes.	3	8A	1	-
	7.2	While faculty may be on board with CBE, the CBE program could eventually evolve back into a traditional program by diluting the assessments.	Standard requires institution have a quality check of their assessments prior to be used. Standard further requires that the assessment be re-reviewed for quality on a systematic basis.	Standard requires institution have a quality check of their assessments prior to be used.	Standard does not require institution have a quality check of their assessments prior to be used.	1	-	1	-

Table 3 (continued).

	7.3	CBE stopped C and D students from moving on because they were not at the mastery level. CBE helped retain weak students in a holding pattern. Institutions must decide what to do with these students. Choosing when to use a regression or multiple-cut offs for the assessments may be appropriate. Students liked how they could not score lower than a B regardless of how many times they took the assessment. Faculty often felt the need to eventually pass them.	Standard requires the institution determine cut-scores and justify why the cut-scores are where they are on the competency scale.	Standard requires the institution determine cut-scores.	Standard does not require the institution determine cut-scores.	1	-	1	-
	7.4	CBE programs must have policies about the number of times a student can repeat an assessment. Furthermore, institutions must consider the time it takes to create parallel assessments for repeating student which is a strain on resources.	Standard requires institution have a policy about how many times a student can repeat an assessment. Standard also requires institution have a plan for supplying necessary resources to make parallel assessments as needed for repeating students.	Standard requires institution have a policy about how many times a student can repeat an assessment. OR Standard requires institution have a plan for supplying necessary resources to make parallel assessments as needed for repeating students.	Standard does not require institution have a policy about how many times a student can repeat an assessment. Standard also does not require institution have a plan for supplying necessary resources to make parallel assessments as needed for repeating students.	2	2D and 3G	2	2D, 3B, 3G, 4G, and 4I

Table 3 (continued).

	7.5	CBE programs must have policies about if a student passes a competency assessment by chance.	Standard requires institution monitor competencies that may be passed by chance by having multiple follow-ups of the competency in the student's program to ensure true competency.	Standard requires institution monitor competencies that may be passed.	Standard does not require institutions monitor competencies that may be passed.	1	-	2	8B
	7.6	Assessments must be mapped back to the competency to ensure the sum of the parts equals the whole.	Standard requires that assessments be mapped to competencies for all programs.	Standard requires that assessments be mapped to competencies for most programs.	Standard does not require that assessments be mapped to competencies.	3	2D, 4A, 4B, and 4F	3	4A and 4F
	7.7	Performance-based assessment is expensive, unfamiliar, time-consuming, and complex. CBE relies on this type of assessment a lot.	Standard requires institutions be able to financially support performance-based assessment. Standard also requires institutions train employees on performance-based assessment.	Standard requires institutions be able to financially support performance-based assessment. OR Standard requires institutions train employees on performance-based assessment.	Standard does not require institutions be able to financially support performance-based assessment. Standard also does not require institutions train employees on performance-based assessment.	2	1F	2	1F and 5D
	7.8	Not everything can be quantifiable, which means the types of assessments must vary as needed.	Standard requires institutions to use multiple methods of assessment as needed for the particular competency, and an assessment employee is provided to help faculty determine which type of assessment would work best.	Standard requires institutions to use multiple methods of assessment as needed for the particular competency.	Standard does not require institutions to use multiple methods of assessment as needed for the particular competency.	2	4C	2	3B, 3G, and 4F

Table 3 (continued).

7.9	Institutions should provide readiness assessments or classes prior to the summative assessment to help students prepare.	Standard requires institution provide readiness assessments prior to the summative assessment in all courses.	Standard requires institution provide readiness assessments prior to the summative assessment in some courses.	Standard does not require institution provide readiness assessments prior to the summative assessment.	1	-	1	-
7.10	CBE assessments must align with professional licensure exams, some of which are not competency based.	Standard requires institutions utilize professional licensing exams when building their programs and assessments.	Standard requires institutions utilize professional licensing exams when building their programs or assessments.	Standard does not require institutions utilize professional licensing exams when building their programs or assessments.	3	2B and 7D	3	7D
7.11	Though assessing in CBE can be time consuming due to the level of detail, assessments must be returned to students quickly.	Standard requires assessments be returned to students in a timely manner and encourages institutions to utilize technology, when possible, to make this happen.	Standard requires assessments be returned to students in a timely manner.	Standard does not require assessments be returned to students in a timely manner.	3	4G, 4J, and 5G	3	4J
7.12	The institution must ensure the assessors themselves are competent.	Standard requires assessors are competent and documents the justification in a public manner.	Standard requires assessors are competent.	Standard does not require assessors are competent.	1	-	1	-
7.13	There must be internal and external assessors. Practitioners must be able to evaluate students. In addition, the institution must ensure practitioners are active participants as they are often no-shows and unreliable.	Standard requires institutions utilize active, practitioners to evaluate students.	Standard requires institutions utilize practitioners to evaluate students.	Standard does not require institutions utilize practitioners to evaluate students.	3	4H, 6A, 6B, and 6E	3	6E

Table 3 (continued).

	7.14	When fully implemented, CBE may create too much repetition of assessments with competency overlap.	Standard does not permit the use of the same assessment more than 10 times throughout the program.	Standard does not permit the use of the same assessment more than 5 times throughout the program.	Standard does regulate how many times the same assessment may be used throughout the program.	1	-	1	-
	7.15	CBE programs should include self-assessments with critical feedback from faculty. These results should then be compared to one another (faculty vs. student). This seemed particularly helpful for lower income, first generation students who were not aware of the educational expectations in a collegiate environment.	Standard requires CBE programs include self-assessments with critical feedback from faculty. These results should then be compared to one another (faculty vs. student).	Standard requires CBE programs include self-assessments with or without critical feedback from faculty.	Standard does not require CBE programs include self-assessments.	1	-	1	-
#8 Issues with Student Services	8.1	If advisors are not experts in the content area, then students can face difficulties.	Standard requires advisors be content-area experts.	Standard does not require advisors be content-area experts. It does require, however, that institutions provide a list to the student of who they can go to for content area expertise.	Standard does not require advisors be content-area experts. It also does not require that institutions provide a list to the student of who they can go to for content area expertise.	2	5C	2	5C
	8.2	Services such as orientation, counseling, and retention are important and should not be overlooked.	Standard requires institutions know CBE students, and create a robust plan to meet the needs of learners inside and outside the classroom.	Standard requires institutions create a plan to meet the needs of learners inside and outside the classroom.	Standard does not require institutions know about CBE students in particular, nor create a robust plan to meet the needs of learners inside and outside the classroom.	3	5A and 5E	2	5A

Table 3 (continued).

	8.3	A learning and resource center (whether online or face-to-face) should be available for student collaboration.	Standard requires institutions provide a learning resource center which also serves as a collaborative space.	Standard requires institutions provide a learning resource center.	Standard does not require institutions provide a learning resource center.	1	-	1	-
	8.4	A list and description about where students can go to voice concern or complain is needed, especially when teaching/coaching roles are dispersed among faculty and staff.	Standard requires the institution provide a list of where and to who students can voice their concerns. Standard requires an organizational structure is listed as well so students understand who they can appeal to higher in the organizational structure, if needed.	Standard requires the institution provide a list of where and to who students can voice their concerns.	Standard does not require the institution provide a list of where and to who students can voice their concerns.	3	5D	1	-
	8.5	The institution should provide ways in which a student can transfer out of the institution to another one, should they not be satisfied. The institution should explain how CBE transfers into credit hours at another school.	Standard requires the institution is transparent about how CBE gets/doesn't get transferred out to other institutions. Standard also requires that the institution work to create articulation agreements with other institutions should the student decide to complete their degree in a traditional manner.	Standard requires the institution is transparent about how CBE gets/doesn't get transferred out to other institutions.	Standard does not require that the institution is transparent about how CBE gets/doesn't get transferred out to other institutions.	2	7C	2	7C
	8.6	The bookstore must be in stock and ready at all times when students are in a self-paced CBE program.	Standard requires the bookstore be available and stocked 24/7.	Standard requires the bookstore be available and stocked most of the time.	Standard does not require the bookstore be available and stocked.	1	-	1	-

Table 3 (continued).

	8.7	Institutions found mentors/faculty were busy with administrative tasks. They spent more time on this than mentoring students.	Standard requires students have access to faculty in a significant way so substantive interaction is formed.	Standard requires students have access to faculty.	Standard does not require students have access to faculty.	3	3E	3	3E
	8.8	Use of a student's prior knowledge should be considered for placement.	Standard requires institutions have clear policies regarding transfer credit, credit-by-exam, or proficiency testing. CBE is required to be specifically mentioned in the policy.	Standard requires institutions have clear policies regarding transfer credit, credit-by-exam, or proficiency testing.	Standard does not require institutions have clear policies regarding transfer credit, credit-by-exam, or proficiency testing.	2	2D	1	-
#9 Issues with Students	9.1	CBE underestimated a student's ability to procrastinate. Students procrastinated and the CBE module got congested. Time management is essential.	Standard requires program teach students about time management and procrastination, and provides interventions when needed.	Standard requires programs teach students about time management and procrastination.	Standard does not require programs teach students about time management and procrastination.	1	-	1	-
	9.2	Students cited that they could not identify with the college since their work was completed away from campus.	Standard requires institutions find ways for students to still feel a part of campus, even though the program may be online. Students are also offered a chance to visit campus at least one time in program, whether through orientation, graduation, or a course requirement.	Standard requires institutions find ways for students to still feel a part of campus, even though the program may be online.	Standard does not require institutions find ways for students to still feel a part of campus.	1	-	1	-

Table 3 (continued).

	9.3	Students wanted to be in the same room as one another, and they did not feel like there was enough social interaction built into the program.	Standard requires institutions to build social interaction into every module in the program.	Standard requires institutions to build social interaction into some modules in the program.	Standard does not require institutions to build social interaction into any modules in the program.	3	5F	3	5F
	9.4	Some students did not want CBE. They understood that CBE raises the standard and requires more evidence of understanding. They had learned how to manipulate traditional education to get by. They did not want to work that hard in CBE. The assessment system was powerful and pointed out their flaws, which they did not want to hear.	Standard requires that the students who are admitted understand what CBE is going to entail before enrollment.	Standard requires that students understand what CBE is going to entail at enrollment.	Standard does not require that students understand what CBE is going to entail.	3	5D and 3D	2	7A and 7B

Table 3 (continued).

	9.5	Students felt CBE was dehumanizing because everything is measured.	Standard requires institutions go over assessment results with the student and converse with them about how they can better themselves in a non-demeaning manner.	Standard requires institutions go over assessment results with the student and converse with them about how they can better themselves.	Standard does not require institutions go over assessment results with the student or converse with them about how they can better themselves.	3	4G and 3E	3	4G
	9.6	If there is a high student drop-out rate, then word can spread of students' dissatisfaction to hopeful recruits. This was particularly true of new programs.	Standard requires institutions track why students withdraw from the program, and use that data to make improvements.	Standard requires institutions track why students withdraw from the program.	Standard does not require institutions track why students withdraw from the program.	1	-	1	-
#10 Issues with Diversity	10.1	CBE must have individualized learning plans, particularly for disadvantaged students.	Standard requires CBE programs have individualized learning plans for all students and for disadvantaged students in particular.	Standard requires CBE programs have individualized learning plans for all students.	Standard does not require CBE programs have individualized learning plans for students.	3	1H, 3F, 3G, 3H, 5B, and 5C	3	3F and 3H
	10.2	CBE competencies must avoid bias.	Standard requires all competencies are checked for bias before accepted for use into the program. The mechanism of checking for bias should also be non-bias.	Standard requires all competencies are checked for bias before accepted for use into the program.	Standard does not require all competencies are checked for bias before accepted for use into the program.	1	-	1	-
	10.3	CBE assessments must avoid bias.	Standard requires all assessments are checked for bias before accepted for use into the program. The mechanism of checking for bias should also be non-bias.	Standard requires all assessments are checked for bias before accepted for use into the program.	Standard does not require all assessments are checked for bias before accepted for use into the program.	3	4D	3	4D

Table 3 (continued).

	10.4	There were low completion rates. Some programs had to raise their admission standards, which excluded anyone who was not a self-paced learner from admission. This led to elitism and issues of access. CBE is very demanding and it is good for those who take initiative, are mature, and have high tenacity; but, those who need it least benefit from it most.	Standard requires that programs teach students how to learn in a CBE program, regardless of background.	Standard requires programs require a test at the point of admission so that only self-paced learners can gain entrance to the program and advertise the program as for these students in particular.	Standard does not requires that programs teach students how to learn in a CBE program, regardless of background. Standard also does not require programs require a test at the point of admission so that only self-paced learners can gain entrance to the program and advertise the program as for these students in particular.	3	1H, 3F, 3G, and 3H	3	1H and 3F
	10.5	CBE tended to work best for middle class adults only. It works best for those who already have work experience and are looking to complete an advanced degree.	Standard requires institutions research why their programs are not working for students other than middle-class adults, and use that data to make improvements to the program to increase access to other populations.	Standard requires institutions publish that their programs are best for adults only.	Standard does not require institutions publish that their programs are best for adults only. Standard also does not require institutions research why their programs are not working for students other than middle-class adults, and use that data to make improvements to the program to increase access to other populations.	3	1H, 3F, 3G, and 3H	3	1H, 3F, and 3H

Table 3 (continued).

#11 Issues with Administrative or Business Processes	11.1	The Registrar's Office had difficulty processing registration when students stop and go.	Standard requires institutions work with the Registrar to update registration processes to better align with CBE. Standard requires administrators provide resources for consultants to edit the registration processes should the Registrar need help setting up the student information system.	Standard requires institutions work with the Registrar to update registration processes to better align with CBE.	Standard does not require institutions work with the Registrar to update registration processes to better align with CBE.	3	1G	3	1G
	11.2	The Registrar's Office had difficulty transcripting in bulk if the CBE transcript is not an addendum to the traditional one.	Standard requires institutions work with the Registrar to update transcript processes to better align with CBE. Standard requires administrators provide resources for consultants to edit the transcript processes should the Registrar need help setting up the student information system.	Standard requires institutions work with the Registrar to update transcript processes to better align with CBE.	Standard does not require institutions work with the Registrar to update transcript processes to better align with CBE.	3	1G and 7E	3	1G
	11.3	CBE required a great deal of coordination, which is in juxtaposition of institutions of higher learning that often work in silos. CBE may work better on a smaller scale (i.e.: program or department vs. entire institution).	Standard requires institutions start CBE on a small level and then move bigger. Standard requires initial programs keep track of lessons-learned to help future new programs at the institution during their development phase.	Standard requires institutions start CBE on a small level and then move bigger.	Standard does not require institutions start CBE on a small level and then move bigger.	1	-	1	-

Table 3 (continued).

	11.4	The Business Office had difficulty billing when students stop and go. Calculation of tuition and fees is difficult.	Standard requires institutions work with the Bursar to update billing processes to better align with CBE. Standard requires administrators provide resources for consultants to edit the billing processes should the Bursar need help setting up the student information system.	Standard requires institutions work with the Bursar to update billing processes to better align with CBE.	Standard does not require institutions work with the Bursar to update billing processes to better align with CBE.	3	1G	3	1G
	11.5	The lack of PR/marketing and explaining this pedagogy both internally and externally led to confusion.	Standard requires institution to have plan for public relations and marketing that clearly states what CBE is, and use feedback to improve the marketing.	Standard requires institution to have plan for public relations and marketing that clearly states what CBE is.	Standard does not require institution to have plan for public relations and marketing that clearly states what CBE is.	1	-	1	-
	11.6	CBE required a lot of paper and a strain on secretarial resources.	Standard requires CBE programs limit the use of paper by relying more heavily on electronic resources. Furthermore, standard requires more administrative support is hired if deemed necessary by the faculty.	Standard requires CBE programs limit the use of paper by relying more heavily on electronic resources. OR Standard requires more administrative support is hired if deemed necessary by the faculty.	Standard does not require CBE programs limit the use of paper by relying more heavily on electronic resources. Furthermore, standard does not require more administrative support is hired if deemed necessary by the faculty.	3	1E and 1G	2	1E

Table 3 (continued).

	11.7	There were substantial investments for the outlier students who decide to go much faster or go much slower than their counterparts. Investments included faculty/coaching time and room space for face-to-face programs in the case of collaboration.	Standard requires full resources to ensure a comprehensive personalized learning environment.	Standard requires some resources to ensure a comprehensive personalized learning environment.	Standard does not require institutions provides resources to ensure a comprehensive personalized learning environment.	3	3H	2	3H
	11.8	If a public institution, CBE must gain legislative support from the state.	Standard requires institutions explain and advocate for CBE to their legislators.	Standard requires institutions explain CBE to their legislators.	Standard does not require institutions explain or advocate for CBE to their legislators.	1	-	1	-

Table 3 (continued).

	11.9	Institutions must ensure they are following all regulations of their stakeholders including Veteran Administration rules, which are difficult to comply with due to low credit generation. Similarly, the institution must comply with their own policies on incomplete grades (or make new policies that are consistent with federal guidelines) if there is no deadline for completion. Also, the institution must be aware of competing policies. For example, institutions must be ready to determine whether CBE programs will get an exception to the institution's low course enrollment policy, should a student be moving very slow or very fast through the program.	Standard requires institutions perform an audit of their CBE policies/practices to external policies, and create changes as needed to ensure compliance. Furthermore, the standard requires that institutions question policies made for traditional programs that are not in the best interest of CBE students.	Standard requires institutions perform an audit of their CBE policies/practices to external policies, and create changes as needed to ensure compliance.	Standard does not require institutions perform an audit of their CBE policies/practices to external policies, nor create changes as needed to ensure compliance.	3	1D	3	1D and 8C
	11.10	In a direct assessment CBE program, testing out of courses threatened the survival of lower level courses (like ENG-101 for example) which other programs needed.	Standard requires institution have a plan for how CBE might affect other courses or programs. Institutions should also allow students to use CBE to test out of the entry level courses (should they be able to) even if they are not in an entire CBE program.	Standard requires institution have a plan for how CBE might affect other courses or programs.	Standard does not require institution have a plan for how CBE might affect other courses or programs.	1	-	1	-

Table 3 (continued).

#12 Issues with Outcomes	12.1	CBE has difficulty predicting success of students' post-graduation.	Standard requires CBE programs use predictive analytics to determine success of students' post graduation, and then follow-up with graduates to determine whether predictions were accurate.	Standard requires CBE programs use predictive analytics to determine success of students' post graduation.	Standard does not require CBE programs use predictive analytics to determine success of students' post graduation.	3	1H	3	1H
	12.2	CBE tended to lengthen the time to degree because students must prove they know more; it did not shorten it.	Standard requires CBE programs monitor how fast students move through the program and publish that information on their website.	Standard requires CBE programs monitor how fast students move through the program.	Standard does not require CBE programs monitor how fast students move through the program.	1	-	1	-
	12.3	CBE institutions should follow up with their alumni and review their job performance data to see where weaknesses in the program lie.	Standard requires institutions follow up with a sample of their alumni to review job performance data, and then use that data to make improvements to the curriculum.	Standard requires institutions follow up with a sample of their alumni to review job performance data.	Standard does not require institutions follow up with a sample of their alumni to review job performance data.	3	1H and 8D	3	8D
#13 Issues with Transparency	13.1	CBE programs should publish competencies publicly.	Standard requires institutions publish competencies publicly as well as how those competencies were decided on.	Standard requires institutions publish competencies publicly.	Standard does not requires institutions publish competencies publicly.	2	7A	1	-
	13.2	CBE programs should publish assessment criteria publicly.	Standard requires institutions publish assessment criteria publicly as well as how those assessments were made.	Standard requires institutions publish assessment criteria publicly.	Standard does not require institutions publish assessment criteria publicly.	1	-	1	-

Table 3 (continued).

	13.3	CBE programs should publish how competencies are aligned to assessments and learning activities publicly.	Standard requires institutions publish the curriculum map including competencies, content, learning activities/experiences, and assessment example be posted publicly.	Standard requires institutions publish the curriculum map publicly.	Standard does not requires institutions publish the curriculum map publicly.	2	7A	1	-

Results of Research Question 2

In RQ2, the study sought to determine the policies and procedures for assessment in CBE programs, and to determine whether the institutions interviewed were aligning with best practices or not. The variables of interest were the best practices in assessment, as detailed in Chapter II Table 2, and the institution's assessment practices.

The method used to answer this question was qualitative research. The researcher interviewed three Directors of CBE (or similar titles) at institutions that offer competency-based education programs. The questions for the interview were created based on the best practices from Table 2 in Chapter II. The researcher sought to understand where CBE institutions align and do not align with best practices as it relates to performing assessments. Because of this, the qualitative interviews also served as an evaluation. All evaluation practices were in accordance to *Program Evaluation: Alternative Approaches and Practical Guidelines* written by Fitzpatrick, Sanders, and Worthen (2011). The approach to the evaluation was decision-oriented so, as a benefit to those participating in the study, the employees at the CBE schools could see how they might adjust their programs to achieve alignment to best practices. It was also expertise-oriented because the May 2017 standards (one of the best practices) created by CBEN were written and designed by expert administrators of longstanding CBE programs. All qualitative research practices followed were in accordance to *Qualitative Research in Practice* written by Merriam (2002). The interview guide can be found in Appendix E.

Three CBE administrators (who serve as Directors of CBE or similar) were

interviewed with the guide (found in Appendix E) as part of RQ2. Two were from public, 4-year institutions and one was from a private, for-profit institution. Of those, two of the institutions had a substantial number of CBE programs while one had just a few programs. In addition, two were mature programs while one was rather new. One institution followed the direct assessment CBE model and the other two followed the course-based with credit equivalency CBE model; for a reminder of what these models are, please see the definitions section of Chapter I. Since there were relatively few institutions that offer CBE (51 according to Table 1) and for the privacy of the participants as well as the institutions, these descriptor variables (private vs. public; many programs vs. few programs; maturation of program; and type of CBE model) were not detailed in aggregate terms as the researcher analyzed the interviews to understand whether these CBE programs were or were not aligning with best practices.

After the approval of The University of Southern Mississippi's Institutional Review Board (which can be found in Appendix F), participants were solicited via email. The researcher obtained written participant consents and then scheduled phone calls. Each phone call lasted between 45-59 minutes. The researcher used the interview guide (found in Appendix E) to prompt questions. Each interview was recorded. After all interviews were completed, they were transcribed.

After the transcription, the process the researcher used to interpret the data was to read all interviews once first. After they were read once, the researcher read them a second time. During this second read, the researcher recognized themes discussed and created a free-form concept map. Wheeldon and Faubert (2009) recommend using free-

form concept maps to demonstrate non-hierarchal/directional relationships, and to recognize themes in the qualitative data analysis process. Figure 8 demonstrates the important themes of assessment in competency-based education programs (as found through the interview), and specifically does not address any directional or hierarchical relationship between these themes. The free-form concept map instead serves as a word cloud to illustrate that a relationship simply exists between the different themes that contribute to assessment in CBE.

Figure 8. Free-Form Concept Map: What theses are included in CBE assessments?

After the themes were identified, the researcher started determining where there were similarities or differences between programs. The researcher also determined whether the programs were aligned with the best practice or not. These results are first detailed in narrative form, and then can be found in summary Table 5.

Results of Themes – Narrative

The themes in which the researcher found that there were striking similarities or striking differences between the institutions' practices have been reported in this

dissertation and are listed in the indented headers below. To repeat RQ2, this part of the study sought to determine what the policies and procedures are for assessment in CBE programs and to understand whether these institutions are aligning with best practices. The headings for each theme below begin with identification of whether it is describing similarities or differences, with the subheading describing the theme itself.

Similarity: use of authentic assessments.

Best-practice authors McClarty and Gaertner (2015) stated that "the processes students use to complete the assessment tasks must be authentic" (p. 6). "Authentic assessments evaluate real-world competencies and the ability of students to perform in complex scenarios" (Everhart, 2014, p. 2). All participating institutions reported using authentic assessments. The direct assessment institution relied solely on these assessments, while the other two used mostly authentic ones, but also had some exam-based assessments for knowledge-based competencies. Each institution defined what authentic assessment meant to them similarly. One anonymous participant (2017) provided his/her own definition:

> Authentic assessment is just something approximating what's happening in the real world. For example, a lot of the competencies in the communication area were a mix of activities, discussions, and quizzes. All of them were a mix from a variety of areas. Assessment was not just a test or a quiz type assessment. It might've been, 'submit an example of an email communication you would use in regard to a given topic.' Whatever we determined was something the student

would submit in the real-world would be reviewed and scored.

The institutions were aligned with this best practice.

Similarity: use of rubrics.

Many best practice authors commented on the use of rubrics in CBE. Best practice author Rowan (2015) stated that "performance-based measures rarely have right and wrong answers. Instead, they are often projects that require subjective evaluation. Thus, strong rubrics and evaluator training are necessary to effectively measure student performance of these competencies" (p. 6). Rowan (2015) also said that "strong rubrics must be properly vetted to ensure that the descriptions are not ambiguous; that is, reviewers are interpreting the descriptions in exactly the same way each time" (p. 6). In another best practice publication called *Assessing Courses and Programs* (2016), the authors stated that "rubrics should have performance ratings and performance descriptions" (p. 12). Best practice authors Wiggins and McTighe (2008) said that students should be able to see the rubrics to have a clear understanding of the expectations. Wiggins and McTighe (2008) also said that "faculty should re-define and refine rubrics based on student work" (p. 181). Rowan (2015) and best practice authors Mattison, Sculthorp, and Zacharias (2017) all stated that faculty training on assessment was important. Finally, more best practice authors McClarty and Gaertner (2015) said that "CBE programs must determine how well a student must perform on the assessment in order to demonstrate competency—in other words, what is the cut score that separates the competent from the not-yet-competent?" (p. 3).

For each authentic assessment that existed, each participating institution utilized rubrics. Rubrics were created based on the competencies, and faculty determined the cut-off mastery level. Each institution had a substantial process regarding how the rubrics were created, how faculty and assessors were trained, and how the rubrics were continuously updated to become more and more valid. At each of the institutions interviewed, the students had access to the rubrics so they could see how their performance would be evaluated. One anonymous participant (2017) explained how their rubrics were approved and updated:

> We did a lot with the rubric training and rubric norming where we would get together before a rubric was to be released, and we would review it together as a team. The first time the rubric ran, we would collect all the student's responses and what they submitted, and we'd go through the norming and scoring together to discuss why we were scoring it in particular ways, and then make any revisions to the rubric we felt were needed based on those conversations. Then certainly we had ongoing communications with the instructors and the assessors throughout. Anytime one would come to us and say, 'Wow. This really didn't work and here's why,' we could take it back to the committee and have a discussion about it.

The institutions were aligned with this best practice.

Similarity: reporting validity.

Best practice authors McClarty and Gaertner (2015) said "providing validity evidence based on test content means showing the relationships between test questions or

tasks and the defined competencies" (p. 6). Best practice author DeMark (2016) also said that "the assessment teams should have access to psychometricians to pull and assess quantitative data in order to assure the reliability of assessments" (p. 86). When discussing validity during the interviews, results varied; however, there were more similarities than differences. Each institution pointed back to how their rubrics were created and how they were approved by experts prior to their use. One anonymous participant (2017) explained their process for checking for validity at their institution:

> So we don't actually have a person specifically in our office who does that, but our teaching and learning centers that we work with, they have either a psychometrician on staff or we can easily contract with someone. The Centers will have a psychologist or someone who specializes or usually knows the techniques that you have to go through to apply a psychometric analysis to a particular question. There's different ways you can check for the quality of your assessments, one being psychometric and then the other being more down the validity pathway. I will tell you that probably 10% of what we do with our assessments relies on a psychometrician. If we have any sort of an exam-based test, we're always going to be trying our best to write good test questions that are psychometrically well written and that we can actually perform some psychometrics on them. We follow standard protocols and practices through our assessment offices to make sure that faculty write good questions in the beginning. In the end when we're trying to make sure we ascertain their psychometric quality, we want to have good questions so we can collect the

> psychometrics and make sure they're high quality, objective assessments. With that said, 90% of our assessments rely on more construct validity and content validity checking through experts and rubrics.

The for-profit institution did rely on a psychometrician. This anonymous participant (2017) stated the following:

> We contract with an external psychometrician. We have a psychometrician during the development process as well, so both before students go in, all of the assessments and rubrics are assessed by a psychometrician, and then after we have student data, we go through that process again.

The anonymous participant (2017) at the institution with just a few programs said their validity-checking process was not official:

> It was part of our review process, but did we have official beta testing or any official process? No. It was basically student feedback. Looking at scores and saying, 'Wow. Everybody really did poorly on project nine, so let's go back and look at project nine,' kind of thing. We were moving at such a quick pace, and the institution was making us turn it around so quickly and roll it out again that there was no official process to that.

The institutions were semi-aligned with this best practice because not all questions were validated.

Similarity: reporting reliability.

Best practice authors McClarty and Gaertner (2015) explained the importance of

reliability in CBE as well as how to measure it:

> There are different ways to measure different types of reliability, including test-retest (where students take the same test form on different occasions), internal consistency (which measures the extent to which students respond similarly to items within a single test form), and inter-rater reliability (where two or more raters evaluate the same student performance on a test). Students should receive approximately the same score if they take a test multiple times, regardless of the test form administered or the raters scoring it. (p. 7).

Best practice authors Domaleski et al. (2015) also said reliability statistics should be monitored. None of the participating institutions had multiple assessors to ensure reliability; however, they did test their rubrics for reliability prior to implementing them. An anonymous participant (2017) at one institution stated that CBE should be treated no differently than traditional education, which does not check for reliability either:

> There's only one assessor in our CBE programs. I mean, it's prohibitive if you think about higher education in general. I mean, if you're going to a non-competency-based education English course, your TA or your one faculty member will be looking at the assessment. You're not going to have multiple folks, generally. I mean, there may be some instances where that happens. But, we don't have that multiple checking. The only time we'll do multiple checking is when we're trying to make sure we establish a good baseline of what the rubric has on it in terms of the criterion.

The other two institutions reported the same information. The institutions were semi-

aligned with this best practice because they tested for reliability during the program's creation but not after implementation.

Similarity: updating assessments.

Best practice author DeMark (2016) said "teams of faculty, content experts, and assessment specialists should be charged with developing, monitoring, and maintaining assessment quality" (p. 86). Each institution had a clear process for updating assessments. One institution looked at them every semester, one every year, and one every other year. One anonymous participant (2017) explained what their institution reviewed to ensure their assessments are of high quality:

> Once a particular project is released, it goes on a tracker; and then within two years we will review all of the competencies, assessments, and all of the support material with a faculty member and an instructional designer to make sure that everything is relevant and current. We're actually tracking a lot of things related to the assessments. We estimate how long a student will work on an assessment and if it takes them too long, then we'll adjust. We look at everything from the instructions to the level of rigor. We may adjust the rubric, so we're actually tracking quite a bit of data using our learning management system to make sure that students can be successful.

The institutions were aligned with this best practice.

Similarity: comparing assessment results to job performance.

Best practice authors McClarty and Gaertner (2015) said "relating performance on

CBE assessments with performance in the workplace is crucial if CBE programs want employers to view their assessments and their competency thresholds as credible evidence of students' career readiness" (p. ii). Every institution was interested in comparing their assessment results to their graduates' job performance, but none had started the process. The for-profit institution had reported graduate success to the Department of Education in compliance with the Gainful Employment rule but was interested in doing something CBE-specific as well. The institutions were not aligned with this best practice because they had not started this process.

Similarity: requiring substantive interaction with faculty.

Best practice CBEN standard (May 2017) said "faculty and staff position descriptions reflect an intentional model designed to support the CBE student effectively." Each institution had ways in which substantive student-faculty interaction occurred. At the direct-assessment institution, the instructor and assessor were the same faculty member, and their learning management system prompted them for substantive interaction. If a student and faculty member had not communicated in a weeks' time, the system prompted them to do so. The direct-assessment institution said this led to more meaningful contact. "We use the same faculty members, so the continuity of that student faculty communication is a lot more tighter, and often times the student and the faculty member have a much closer relationship" (Anonymous, 2017). At another institution, their policy was that all assessments required a written, narrative response from the faculty member. This institution also required weekly check-ins between students and

faculty; the anonymous participant (2017) at this institution explained their check-in process:

> In those check-ins we would ask, ‘Are there any areas you see you need additional assistance?’ or ‘Have you read this article?’ or ‘Have you viewed this video?’ We'd also offer, ‘Would you like to have a phone conversation or a check-in?’ Things like that.

The last institution did something a little different. In addition to requiring narrative feedback on assessments, they offered between three-to-seven live classroom sessions per week, should the students wish to join. The anonymous participant (2017) at the institution explained how their live classrooms provided more opportunity for substantive interaction between faculty and student:

> If the student is really focused on or hung up on a competency, the faculty member will schedule one for that week, and whoever among our students are spending time on that competency will come to the live classroom, ask the big questions, get guidance on the assignments, collaborate with each other, and collaborate with the faculty.

All institutions were aligned with this best practice, depending on how substantive interaction is defined.

Similarity: timeliness of feedback.

Best practice CBEN standard (May 2017) said “the timeliness of feedback from assessments enables learners to proceed with the absolute minimum of delay. Technology

is used whenever possible to facilitate and expedite the timeliness of feedback" (p. 17). Each participating institution had a policy for how quickly feedback on assessments should be provided to students. One institution required they be returned to students within 48 hours. Another institution required a response in three to four days. The direct-assessment institution required it in three days. The institutions were aligned with this best practice.

Similarity: comparing traditional education to CBE.

Best practice authors McClarty and Gaertner (2015) said that "CBE programs should continue to collect and monitor graduates' life outcomes in order to provide evidence that a CBE credential stands for a level of rigor and preparation equivalent to a traditional postsecondary degree" (p. iii). For the institutions that had a same program offered in traditional education and CBE education, the programs were compared to one another. An anonymous participant (2017) at one institution explained how they did this comparison:

> We track the amount of time from the start of taking projects or courses to degree completion. We track that degree completion time and we compare it. We want to, for example, understand if students are taking longer in the CBE model as compared to the traditional model.

The institutions were semi-aligned with this best practice. While a comparison was occurring, the best practice was about comparing the levels of preparation between traditional education and CBE, not time to completion.

Similarity: providing public statistics.

Best practice authors McClarty and Gaertner (2015) stated that reliability and validity statistics should be made public. None of the participating institutions had their reliability and validity statistics on a public website. One participant said, “We don't publicly document them, no. Just like they're not documented for any other type of non-CBE academic program that we have” (Anonymous, 2017). The institutions were not aligned with this best practice.

Differences: requiring multiple methods of assessment.

Best practice author Rowan (2015) said “each competency must be measured more than one time and in more than one way (that is, multiple choice tests, papers, presentations, performance-based, real-world assessments, etc.)” (p. 5). The report called *Assessing Courses and Programs* (2016) also stated that “assessments should cover knowledge, skill, and performance. Students should demonstrate they know these in different ways” (p. 10). The private, for-profit institution did not require multiple methods of assessment prior to marking a student at the mastery or competent level. The other two public institutions required multiple data points before marking a student as competent. A participant from a public institution said the following: “we tried to have an assessment for knowledge, skills, and abilities: at least one assessment for each of those” (Anonymous, 2017). The anonymous participant (2017) from the other public institution explained their process as well:

We do have multiple checks on a student's mastery so that we can triangulate and

> confirm that a student has truly mastered them. We don't believe that a student writing one artifact (for example: a letter to an editor or a response in a fictitious court trial) shows they have mastered a competency. The student has to demonstrate that particular competency multiple times under different circumstances just to make sure, you know? We need to have a sense of confidence that the student has demonstrated competency more than once.

The for-profit institution was not aligned with this best practice, while the public institutions were.

Differences: faculty involvement with formative assessments.

In the best practice publishing called *Assessing Courses and Programs* (2016), the authors stated that "the primary purpose of assessment is to improve students' learning and teachers' teaching as both respond to the information it provides" (p. 6). Best practice authors Mattison, Sculthorp, and Zacharias (2017) also stated that "faculty should not only be responsible for evaluating learner competence, but also for providing the formative feedback necessary for learners' ultimate mastery of said competence" (p. 187). Each institution offered formative assessments, but their level of support of the formative assessments varied a great deal. The direct-assessment institution provided model projects and the assessment rubric for their formative assessments. The student could complete the model project if they wanted to; but they did not have to because they could simply review the model (and rubric) to see what the faculty member would be looking for on the summative assessment. Should the student wish to complete the model

project, they could; but the anonymous participant (2017) at the direct-assessment institution admitted that it was a strain on resources:

> We try very hard to allow students to do as much self-checking as they can with the option to have a faculty member get involved if a student feels they need that extra layer of support. The challenge is that faculty on our campuses, like all faculty, are very busy. We don't always have the faculty members providing written feedback on formative assessments unless it's requested.

The private, for-profit institution provided formative assessments that were not project-based and did not mirror the summative assessments quite as well. “The student essentially goes through the content for the formative assessments. That could include videos and some gamification. It includes text, visuals, et cetera, mixed in with formative knowledge checks along the way” (Anonymous, 2017). The institution with just a few CBE programs had their formative and summative assessment as the exact same; the difference would only be to whom the student was submitting the assessment. If the student submitted it to the course mentor, the assessment was considered formative. If the student submitted it to the assessor, it was considered summative. The anonymous participant (2017) at this institution explained their process:

> Once the student decided they were ready and submitted to the assessor, they were getting scored and it would count. Up to that point, they could submit to the mentor or the instructor for feedback, and they would give guidance in accordance to the rubric. They’d also point out various areas the student might want to look at again.

The institutions were not aligned with this best-practice because, while formative assessments were offered, a faculty member was not clearly involved in the formative assessment process.

Differences: measuring general education.

Best practice authors Mattison, Sculthorp, and Zacharias (2017) stated that measuring general education can be difficult, but that should institutions determine how to measure general education, they should do it as well as share research results to the community. The view on whether general education could be measured was quite different at the participating institutions. At the for-profit institution, the participant said they found ways to measure all their liberal arts outcomes. The anonymous participant (2017) stated that measuring general education was not a problem there:

> I don't agree with people who say that the liberal learning tradition cannot be measured. It's a different process, most certainly, but I think there are a lot of really important efforts outside of competency-based education that are measuring it. You just look at the work that the AAC&U has been doing, the LEAP effort, and the VALUE Rubrics. When people say that general education as a liberal arts tradition cannot be measured, I, frankly, find it to be a failure of imagination. I think it can be done. It is being done.

Another anonymous participant (2017) stated that their program struggled with this:

> I don't know if we found a great way to measure liberal arts with things like critical thinking. We really struggled with it in the beginning and seemed to find

> some ways towards the end, but I don't know. I mean, I don't think we are where we want to be with them. We definitely aren't done improving in that area.

The last anonymous participant (2017) said it was a struggle at first, but that they were able to find ways to measure the liberal arts with some faculty creativity:

> Faculty struggled, and I think once we took a step back and said, 'Let's remove this abstract assessment to which they had been doing for decades and instead of think how students might use these competencies in the real world,' people started to get creative with how they could measure the competencies. We have, for example, chemistry, which I mean, the faculty were pretty much throwing their arms up saying, 'It's impossible for students to master chemistry in a real way.' All we did to change that was that students do all the chemistry experiments in their personal kitchens. The other one is algebra, which is a perennial challenging math course for a lot of students. We challenged the faculty to work with our instructional designers so that all of those problems actually had some application to the real world, so students will use algebra to solve marketing problems or other problems that you'd encounter in the real world.

This institution also reported that some of their faculty were beginning to publish literature on their success. The institutions were semi-aligned with this best practice. The for-profit institution was measuring liberal arts, but not publishing how. The institution with few programs was struggling to measure liberal arts. The last institution was fully aligned because they were measuring liberal arts and publishing information on it.

Differences: guarding against bias.

The best practice CBEN standards (May 2017) stated that "the assessment strategy and each of the assessments and their corresponding rubrics should equitably measure learning outcomes across diverse student groups, while guarding against bias in formative and summative assessments" (p. 17). Two of the institutions helped to guard against bias during the creation of the program's assessments and competencies. One anonymous institutional participant (2017) explained their process:

> When you write good test questions you have to be very careful that you're not biasing. Really what happens at our centers for teaching and learning that help us do the training is they look very closely at how people write in information about students and how they present the context. There's a lot of research that we've based these practices on in terms of writing unbiased questions. We're certainly not like the ACT or the SAT where we have question banks of thousands of questions and we're always piloting them, but we do our best to follow good test writing practices that remove bias. We're really trying to make sure that when we write a scenario or when we write the scaffolding that surrounds the assessment, that we aren't biasing a particular group of students. We're looking for socio-economic status bias. We're looking for race and ethnicity bias. We're looking for gender bias and gender-preference biases, too. We try hard. I mean, certainly there's lots of training that we provide on those types of topics. You know, I certainly can't stand on a hill and say that we've never had a biased question or a biased scenario, but we try very hard to remove it as much as possible.

Another institution did this too, but also looked at their outcomes and graduation rates by demographic group. The institution with only a few CBE programs admitted that they had not been intentional about this but should have been in retrospect. The two institutions that had many programs were aligned with this best practice, while the institution that offered only a few CBE programs was not.

Summary of Theme Results of RQ2

The summary of these results of themes for RQ2 can be found in Table 4 below.

Table 4

RQ 2 Summary of Results

Best Practice	Aligned	Semi-Aligned	Not-Aligned	Comments
Use of Authentic Assessments	✓			
Use of Rubrics	✓			
Reporting Validity		✓		The institutions were semi-aligned with this best practice because not all questions were validated.
Reporting Reliability		✓		The institutions were semi-aligned with this best practice because they tested for

Table 4 (continued).

				reliability during the program's creation but not after implementation.
Updating Assessments	✓			
Comparing Assessments to Job Performance			✓	The institutions were not aligned with this best practice because they had not started this process.
Requiring Substantive Interaction with Faculty	✓			
Timeliness of Feedback	✓			
Comparing Traditional Education to CBE		✓		The institutions were semi-aligned with this best practice. The best practice was about level of preparation, not time to completion, which the institution's reported on.
Providing Public Statistics			✓	The institutions were not aligned with this best practice because

Table 4 (continued).

			none of them provided reliability and validity statistics publicly.
Requiring Multiple Methods of Assessment	✓		The for-profit institution was not aligned with this best practice, while the public institutions were.
Faculty Involvement with Formative Assessments		✓	The institutions were not aligned with this best-practice because, while formative assessments were offered, a faculty member was not clearly involved in the formative assessment process.
Measuring General Education	✓		The institutions were semi-aligned with this best practice. The for-profit institution was measuring liberal arts but not publishing how. The institution with few programs was struggling to measure liberal arts. The other institution was

Table 4 (continued).

			measuring it and publishing information on it.
Guarding Against Bias		✓	The institutions were semi-aligned with this best practice. The two institutions that had many programs were aligned with this best practice, while the institution that offered only a few CBE programs was not.

The participating institutions were aligned with five best practice themes in assessment including the use of authentic assessments, rubrics, updating the assessments, requiring substantive interaction between student and faculty, and providing timely feedback to students. The participating institutions were semi-aligned with six best practices themes in assessment including reporting the reliability of their assessments, reporting the validity of their assessments, comparing traditional education to CBE, requiring multiple methods of assessment, measuring general education, and guarding against bias. The participating institutions were not aligned with three best practices themes in assessment including comparing assessments to job performance of graduates,

providing statistical data to the public, and having faculty involved in the formative assessment process. To summarize, the institutions passed five best-practices, failed three best practices, and were somewhat following six best practices. Based on these results, there is room for improvement. The hypothesis for research question two (RQ2-H1) was that the institution's assessment procedures would follow many but not all best practices. Based on the results with only three best practices not being followed at all, the hypothesis was correct.

Results of Research Question 3

In RQ3, the study sought to review CBE's effectiveness by reporting on student outcomes including graduation (RQ 3.1), race/gender equity (RQ 3.2), and job success (RQ 3.3) compared to the same student outcomes from similar, traditional programs. The method used to answer this research question was quantitative.

Results of Research Question 3.1 (Graduation)

For graduation (RQ 3.1), the researcher gathered graduation data from IPEDS. Because CBE is a form of pedagogy, not an academic program, CBE programs are not uniquely coded in IPEDS. In addition, not all institutions are 100% competency-based, except for Western Governors University (WGU). Thus, graduation rates of WGU were compared to similar peer-institutions, as defined by NCES/IPEDS characteristics similar to WGU. The researcher chose to compare institutions to WGU that are Title IV participating, degree-granting, have an enrollment of over 20,000 students, and offer all their programs completely online. The researcher reported both on institution-wide data as well as program specific data.

Institution wide data.

To obtain the institution wide data, the research navigated to https://nces.ed.gov/ipeds/, clicked "use the data", and clicked "data feedback report." The data feedback report has five steps. For the first step which was to define the comparison institution, the researcher typed in "Western Governors University." For the second step which was to choose which data report to download, the researcher chose to "create a custom data feedback report." For the third step which was to choose the comparison group, the researcher held the mouse over "EZ Group" and selected "first look universe" and "Title IV participating." The researcher then opened "degree-granting status" to select "degree-granting." The "institution size category" was also opened and "20,000 and above" was selected. Finally, the "all programs offered completely via distance education" was opened and "yes" was selected." At this point, the researcher clicked the "search" button and the comparison group displayed. The NCES-automated comparison group included Walden University, Colorado Technical University Online, Columbia Southern University, the American Public University System, and Excelsior College. The researcher then proceeded to the fourth step to select the variables of interest for RQ 3.1. RQ 3.1 was specifically interested in graduation data. Under "awards" the "number of degrees awarded, by level 2014-15" was selected. Data under "graduation rates" were not selected because most students at WGU are not first-time degree seeking students; thus, that information would not be helpful or fair to compare to WGU. Under "student enrollment" the "enrollment by student level Fall 2015" was selected as well so a comparison could be made on how many students enroll compared to how many students

graduate. After these two items were selected, the research proceeded to step five to download the report as a PDF. The researcher then repeated these steps, making each institution in the group comparison (in step 3) the comparison institution (in step 1) to populate Table 5. The percentages in the fourth column were then manually calculated by the researcher. The ranking in the last column was added by the researcher as well. Table 5 shows the total degree-seeking enrollment for Fall 2015 as compared to the total number of degrees awarded in the 2014-2015 academic year. In Table 5, WGU ranked 5 out of 6 for its percentage of degrees awarded compared to its total enrollment.

Table 5

RQ 3.1 Institution Wide Graduation Data for All Programs

Institution	Total Degree-Seeking Enrollment for Fall 2015	Total Number of Degrees Awarded for 2014-2015	Percentage	Ranking
Western Governors University	70,504	12,968	18.39%	5
Walden University	52,375	10,835	20.69%	4
Colorado Technical University Online	22,582	5,016	22.21%	2
Columbia Southern University	20,653	7,238	35.05%	1

Table 5 (continued).

American Public University System	50,306	10,700	21.27%	3
Excelsior College	43,123	4,879	11.31%	6

Because the social problem explained in Chapter I and throughout this dissertation tends to focus on undergraduate programs, undergraduate programs only were also reported. Table 6 shows the total undergraduate only degree-seeking enrollment for Fall 2015 as compared to the total number of undergraduate only degrees awarded in the 2014-2015 academic year. In Table 6, WGU ranked 5 out of 6 for its percentage of undergraduate only degrees awarded compared to its undergraduate only enrollment.

Table 6

RQ 3.1 Institution Wide Graduation Data for Undergraduate Programs Only

Institution	Undergraduate Degree-Seeking Enrollment for Fall 2015 Only	Undergraduate Number of Degrees for 2014-2015 Only	Percentage	Ranking
Western Governors University	54,735	8,207	14.99%	5
Walden University	8,239	1,634	19.83%	2

Table 6 (continued).

Colorado Technical University Online	19,822	3,575	18.04%	3
Columbia Southern University	15,152	5,306	35.02%	1
American Public University System	42,888	7,309	17.04%	4
Excelsior College	39,735	4,480	11.27%	6

Program data.

One of the chief ways this dissertation sought to add to the literature on CBE was by providing program-specific data. Thus, the researcher reviewed all the programs at Western Governors University using their website (https://www.wgu.edu/degrees_and_programs#) and tried to find a corresponding program at the other institutions in the comparison group. Three programs were identified at all institutions: an online Bachelor of Science in Information Technology, an online Bachelor of Science in Nursing (RN-BSN) (all institutions but one had it), and an online Bachelors in Business. All programs and their corresponding URLs are bulleted below. While some of these institutions may offer a CBE program (Walden and Excelsior), none of the specific programs listed below are CBE except for those at WGU.

- Online Bachelor of Science in Information Technology:

- Western Governors University: https://m.wgu.edu/online-it-degrees/information-technology-bachelors-program.html
- Walden University: https://www.waldenu.edu/bachelors/bs-in-information-technology
- Colorado Technical University Online: http://www.coloradotech.edu/degrees/bachelors/it
- Columbia Southern University: http://www.columbiasouthern.edu/online-degree/safety-emer-services/information-technology/bs-it
- American Public University System: http://www.apu.apus.edu/academic/schools/science-technology-engineering-and-math/bachelors/information-technology.html
- Excelsior College: https://www.excelsior.edu/programs/technology/information-technology-without-concentration-bachelor-degree

- Online Bachelor of Science in Nursing:
  - Western Governors University: https://www.wgu.edu/online_health_professions_degrees/bachelor_science_nursing
  - Walden University: https://www.waldenu.edu/bachelors/bachelor-of-science-in-nursing

    - Colorado Technical University Online: http://www.coloradotech.edu/degrees/bachelors/nursing
    - Columbia Southern University: Program Not Offered
    - American Public University System: http://www.apu.apus.edu/academic/schools/health-sciences/bachelors/nursing.html
    - Excelsior College: https://www.excelsior.edu/programs/nursing/rn-to-bachelor-degree
- Online Bachelor of Science or Administration in Business:
    - Western Governors University: https://m.wgu.edu/online-business-degrees/business-management-bachelors-program.html
    - Walden University: https://www.waldenu.edu/bachelors/bs-in-business-administration
    - Colorado Technical University Online: http://www.coloradotech.edu/degrees/bachelors/business
    - Columbia Southern University: http://www.columbiasouthern.edu/business-administration/bs-business
    - American Public University System: http://www.apu.apus.edu/academic/schools/business/bachelors/business-administration.html

- Excelsior College: https://www.excelsior.edu/programs/business/business-general-business-bachelor-degree

At this point, the researcher returned to IPEDS to pull graduation data as it relates to these specific programs. Unfortunately, enrollment data to compare to the number of completers was not available at the program level, thus no percentage was calculated. See Table 7. A rank is still provided based solely on the number of graduates an institution completed by program. Because there was no enrollment data, Table 7 is not as helpful for determining how many students graduated as compared to how many students were enrolled. In Table 7, WGU fares well. Compared to the other institutions, it is in second place for the number of business degree completers, in first for the number of information technology completers, and in first for the number of nursing completers.

Table 7

RQ 3.1 2014-2015 Graduation Data for Select Programs Only

Program	Institution	Completers in Program	Rank
Business	Western Governors University	1,048	2
	Walden University	188	5
	Colorado Technical University Online	824	4
	Columbia Southern University	1,010	3

Table 7 (continued).

	American Public University System	1,116	1
	Excelsior College	107	6
Information Technology	Western Governors University	1,187	1
	Walden University	61	5
	Colorado Technical University Online	310	3
	Columbia Southern University	141	4
	American Public University System	510	2
	Excelsior College	31	6
Nursing	Western Governors University	3,455	1
	Walden University	678	2
	Colorado Technical University Online	43	4
	Columbia Southern University	N/A	N/A
	American Public University System	23	5
	Excelsior College	455	3

Summary of Results for RQ 3.1.

Institutionally, WGU ranked 5 out of 6 for its percentage of degrees awarded compared to its total enrollment. WGU also ranked 5 out of 6 for its percentage of undergraduate only degrees awarded compared to its undergraduate enrollment. Programmatically, WGU fared well. Compared to the other institutions, it was in second place for the number of business degree completers, in first for the number of information technology completers, and in first for the number of nursing completers. However, a lack of enrollment data could have off-set the results for RQ 3.1 as it relates to programs only. The hypothesis for research question 3.1 (RQ 3.1-H1) was that the graduation statistics would be about the same as traditional programs. This hypothesis was incorrect. On the institutional-level, the graduation statistics of CBE were worse than traditional education. But, on the programmatic-level, the graduation statistics of CBE were better than traditional education.

Results of Research Question 3.2 (Race and Gender Equity)

For race and gender equity (RQ 3.2), the researcher provided a similar review to that of RQ 3.1. The researcher gathered data from IPEDS and reported both on institution wide data as well as program specific data.

Institution wide data.

Race and gender equity.

To obtain the institution wide data, the researcher followed the same steps at https://nces.ed.gov/ipeds/ as listed in RQ 3.1 for the exception of Step 4. RQ 3.2 was specifically interested in race and gender data. Thus, under "student enrollment" the

"percent of all students enrolled by race/ethnicity and percent of students who are women for Fall 2015" was selected. Based on this information, Table 8 was populated. The percentages were then manually calculated by the researcher. The ranking, based on the percentages, was then added by the researcher as well. WGU ranked last (sixth place) in the race diversity statistic; only 30% of students in Fall 2015 were not white. WGU ranked third in the gender diversity statistic; 62% of WGU students in Fall 2015 were female.

Table 8

RQ 3.2 Institution Wide Race and Gender Enrollment Statistics

Institution	Percent of all non-white students for Fall 2015	Ranking	Percent of women students	Ranking
Western Governors University	30%	6	62%	3
Walden University	62%	1	76%	1
Colorado Technical University Online	56%	2	64%	2
Columbia Southern University	45%	3	39%	5
American Public University System	44%	4	37%	6
Excelsior College	43%	5	54%	4

Program data.

Gender equity.

One of the chief ways this dissertation sought to add to the literature on CBE was by providing program-specific data. Thus, using the same programs identified in RQ 3.1 (an online Bachelor of Science in Information Technology, an online Bachelor of Science in Nursing (RN-BSN), and an online Bachelors in Business) for the six peer-schools, the researcher returned to IPEDS to pull race/gender statistics as it relates to these specific programs. To obtain the program data, the research navigated to https://nces.ed.gov/ipeds/, clicked "use the data", and clicked "compare institutions." At the next screen, the researcher selected "use final release data." For step one, the researcher input the names of the institutions: Western Governors University, Walden University, Colorado Technical University Online, Columbia Southern University, American Public University System, and Excelsior College. Once they were all added, the researcher clicked the "add" button next to "my comparison institution" to select WGU as the comparison institution. The researcher then proceeded to step two which was to select the variables of interest. The researcher opened the drop down "completions" to select "awards/degrees conferred by program (2010 CIP classification), award level, race/ethnicity, and gender - includes new race/ethnicity and award level categories" and then selected "race/ethnicity (old/new/derived) and gender - 2009-10." Once that was selected, the researcher was presented with three additional steps. For step one, the researcher selected "2009-10." For step two, the researcher selected "first

major", Classification of Instructional Program (CIP) Code 52.02 for Business Programs, CIP Code 11 for Information Technology Programs, and CIP Code 51.38 for Nursing Programs. The "Bachelor's award code" was also selected during this step. For the third step, the researcher "selected all" so all gender and race categories would be exported. Once this was completed, the researcher selected "continue." A new screen now displayed. On this screen, the researcher selected "A/D" which opened a window to select other years. "2009-10" was unchecked and instead "2014-15" was checked. The researcher clicked "save" and "continue." The last step was the selection of output. The researcher downloaded the file in a comma separated format (CSV).

Table 9 shows this data. The "completers" and "women completers" columns in Table 9 were filled out based on the downloaded CSV file. The percentages were then manually calculated by the researcher. The ranking, based on the percentages, was added by the researcher as well. In Table 9, WGU ranked third in the gender diversity statistic for business programs; 51.24% of WGU Bachelor of Science in Business students during academic year 2014-2015 were female. WGU ranked fifth in the gender diversity statistic for information technology programs; 8.93% of WGU Bachelor of Science in Information Technology students during academic year 2014-2015 were female. WGU ranked third in the gender diversity statistic for nursing programs; 88.02% of WGU Bachelor of Science in Nursing students during academic year 2014-2015 were female.

Table 9

RQ 3.2 2014-2015 Program Specific Gender Enrollment Statistics

Program	Institution	Completers in Program	Women Completers in Program	Percentage	Rank
Business	Western Governors University	1,048	537	51.24%	3
	Walden University	188	127	67.55%	1
	Colorado Technical University Online	824	467	56.67%	2
	Columbia Southern University	1,010	485	48.02%	4
	American Public University System	1,116	373	33.42%	5
	Excelsior College	107	22	20.56%	6
Information Technology	Western Governors University	1,187	106	8.93%	5
	Walden University	61	20	32.79%	1
	Colorado Technical University Online	310	66	21.29%	2
	Columbia Southern University	141	28	19.86%	3

Table 9 (continued).

	American Public University System	510	87	17.06%	4
	Excelsior College	31	1	3.23%	6
Nursing	Western Governors University	3,455	3,041	88.02%	3
	Walden University	678	621	91.60%	2
	Colorado Technical University Online	43	40	93.02%	1
	Columbia Southern University	N/A	N/A	N/A	N/A
	American Public University System	23	20	86.96%	4
	Excelsior College	455	390	85.71%	5

Race equity.

For the programmatic race equity statistics, the same file CSV was used as the programmatic gender equity statistics. In Table 10, the “total completers in program”

column was filled out based on the downloaded file. The "non-white completers in program" column was calculated by the researcher by subtracting the number of white completers (not shown) from the total number of completers in the program. The percentages were then manually calculated by the researcher. The ranking, based on the percentages, was then added by the researcher as well.

In Table 10, WGU ranked sixth (last) in the race equity diversity statistic for business programs; 22.14% of WGU Bachelor of Science in Business students during academic year 2014-2015 were non-white. WGU also ranked sixth (last) in the race equity diversity statistic for information technology programs; 27.21% of WGU Bachelor of Science in Information Technology students during academic year 2014-2015 were non-white. WGU ranked fifth (also last due to one less institution having this program) in the race equity diversity statistic for nursing programs; 24.57% of WGU Bachelor of Science in Nursing students during academic year 2014-2015 were non-white.

Table 10

RQ 3.2 2014-2015 Program Specific Race Enrollment Statistics

Program	Institution	Total Completers in Program	Non-White Completers in Program	Percentage	Rank
Business	Western Governors University	1,048	232	22.14%	6

Table 10
(continued).

	Walden University	188	97	51.60%	2
	Colorado Technical University Online	824	363	44.05%	4
	Columbia Southern University	1,010	509	50.40%	3
	American Public University System	1,116	442	39.61%	5
	Excelsior College	107	61	57.00%	1
Information Technology	Western Governors University	1,187	323	27.21%	6
	Walden University	61	24	39.34%	2
	Colorado Technical University Online	310	114	36.77%	4
	Columbia Southern University	141	67	47.52%	1
	American Public University System	510	184	36.08%	5

Table 10
(continued).

	Excelsior College	31	12	38.71%	3
Nursing	Western Governors University	3,455	849	24.57%	5
	Walden University	678	239	35.25%	2
	Colorado Technical University Online	43	14	32.56%	3
	Columbia Southern University	N/A	N/A	N/A	N/A
	American Public University System	23	10	43.48%	1
	Excelsior College	455	145	31.87%	4

Summary of Results for RQ 3.2.

In terms of institution-wide data, WGU ranked last (sixth place) in the race diversity statistic and third in the gender diversity statistic. In terms of program data for gender only, WGU ranked third for business programs, fifth for information technology programs, and third for nursing programs. In terms of program data for race only, WGU ranked last in all major programs: business, information technology, and nursing. The

hypothesis for research question 3.2 (RQ 3.2-H1) was that race/gender equity would be higher in CBE programs than traditional ones. The hypothesis was inaccurate for both the institution wide data and the program-specific data.

Results of Research Question 3.3 (Job Success)

For job placement information (RQ 3.3), the researcher reviewed Gainful Employment Data from the U.S. Department of Education. The researcher reviewed this website (https://www.ed.gov/news/press-releases/education-department-releases-new-graduate-earnings-data-career-college-programs) that announced the release of the data and then went to this website (https://studentaid.ed.gov/sa/about/data-center/school/ge?src=press-release) to download the Excel file. The researcher downloaded the 2015 debt-to-earnings data spreadsheet. The data in this spreadsheet "determines whether a gainful employment program prepares students for gainful employment in a recognized occupation. A debt-to-earnings rate is based on the typical loan debt and earnings of a cohort of the program's former students who completed the program" (Gainful Employment Information, n.d.). Each program is listed as to whether it passes or fails this measurement. "Annual earning rates of less than or equal to 8% are considered passing rates. Annual earning rates greater than 8% but less than or equal to 12% are zone rates, and annual earnings rates greater than 12% are failing rates" (Gainful Employment Information, n.d.). Those on the border of pass/fail are put into a zoning status.

Once downloaded, the researcher found the institutions that are in Table 1 within Chapter II of this dissertation. Institutions that offer some CBE were highlighted in

yellow. Institutions that do not offer any CBE were highlighted in pink. Twelve of the 50 institutions from Table 1 (or 24%) were found. After the institutions were recognized, the researcher sought to find the particular CBE programs, detailed in Table 1, within those institutions. Looking at the institutions highlighted in yellow only, the researcher reviewed the programs and determined whether they were CBE or not CBE based on Table 1 in Chapter II. The researcher added a column entitled "Is this a CBE program?". Those with a "1" in the column meant it was CBE and those with a "0" in the column meant it was not CBE. All the 1s were then changed from black to red font for easier visibility to the researcher. In the Excel spreadsheet, the researcher was not able to find all CBE programs listed in Table 1 of Chapter II. The programs the researcher could find are in Table 11 below. As explained earlier in this dissertation, the only institutions that must participate in the Gainful Employment rule are: all programs from private for-profit colleges, and only certificate programs from public or private non-profit colleges. Thus, while some programs could not be found due to error, others could not be found because they are not required to participate in the Gainful Employment Rule.

Table 11

CBE Programs Found in Gainful Employment Excel Spreadsheet for RQ 3.3

Institution	Type	Programs Found
Capella University – FlexPath	Private, for-profit	BS in Accounting, Business Administration, Human Resource Management, Project Management, General

Table 11 (continued).

		Information Technology, Information Assurance and Security, IT Project Management; MBA in Accounting, General Business Administration, Global Operations and Supply Chain Management, Human Resource Management, and Project Management; MHA in General Health Administration; MS in General Information Systems and Technology Management, Project Management, Child and Adolescent Development, Educational Psychology, General Psychology, Industrial/Organizational Psychology, and Sport Psychology; and Minors (with BS degrees) in Network Technology with Cisco/Microsoft and System Development with Mobile/Web Application
City University of Seattle	Public	Alternative route certificate to teacher certification
Danville Community College	Public	Certificate Programs in Welding, IT, and Precision Machining Technology
Kalamazoo Valley Community College	Public	Certificates in Electricity, Mechanical Systems, Integrated Information Technologies, and Automated Control Systems

Table 11 (continued).

Kentucky Community and Technical College System	Public	Each general education discipline is offered in CBE, as are business, nursing, and information technology certificates
Lord Fairfax Community College – Knowledge to Work	Public	Certificate in Hospital Facility Coding
Rasmussen College - FlexChoice	Private, for-profit	Certificates, Diplomas, Associate's, Bachelor's and Master's degrees in Business, Design, Education, Health Sciences, Justice Studies, Nursing, and Technology
Rio Salado College	Public	All certificates are competency-based
Salt Lake Community College	Public	Certificate in Health Care Technology
Sinclair Community College – Sinclair Accelerate	Public	Certificates in Advanced Manufacturing, Unmanned Ariel Systems, and Retail Management
University of Maryland University College	Public	All undergraduate and graduate certificates are competency-based
Walden University – Tempo Learning	Private, for-profit	Master of Science in Early Childhood Studies; Master of Business Administration; Master of Healthcare Administration

After these CBE programs were identified in the spreadsheet, the researcher sorted the Excel spreadsheet by program. Any non-CBE programs that did not have an equivalent CBE program (as listed in Table 11) were deleted. For example, though there were dental assistant programs in the spreadsheet, there are no dental assistant CBE programs in Table 11. Thus, all dental assistant programs were deleted from the Excel document.

A chi-square test for independence was run to test for association between the two categorical variables (program: CBE & not CBE and score: pass, zone, fail). "The chi-squared statistic is a single number that tells how much difference exists between the observed counts and the counts a researcher would expect if there were no relationship at all in the population" (Hopkins, 2017, p. 1). The chi-square statistic is appropriate for this research question and the data meets the assumptions of the statistic, as bulleted below:

- The data includes two categorical variables (score and program);
- Within those variables are two or more levels (score includes pass, fail, and zone; program includes CBE and non-CBE);
- The observations are independent because there is no relationship between the levels nor is there is a pre- or post-test;
- The sample size is large with expected frequencies of at least 5 in each cell (SPSS Tutorials: Chi-Square Test of Independence, 2017).

The chi-square equals the sum of the observed values minus the expected values, and then squared. Once this number is obtained, divide by the expected values. The

equation can be seen in Figure 9. The calculation can be done by hand or electronically. The researcher utilized SPSS to complete the chi-square analysis.

$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Figure 9. Chi-Square Equation

Because a chi-square test for independence does not permit matching pairs, this question did not review data by academic program (like was done in RQ 3.1 and RQ 3.2). Instead, all CBE programs (regardless of major) were grouped together and all non-CBE programs (regardless of major) were grouped together in the analysis.

The first step in the chi-square analysis was to enter the data into SPSS. Because of the number of rows of data this Excel spreadsheet had, the researcher decided to enter the data using the weighted cases format as detailed in Field (2009) chapter 18. Table 12 was entered to create the SPSS .sav file. Table 12 is the contingency table. A contingency table is "a table representing the cross-classification of two or more categorical variables. The levels of each variable are arranged in a grid, and the number/frequency of observations falling into each category is noted in the cells of the table" (Field, 2009, p. 783). Table 12 shows the frequency of how many programs (CBE and non-CBE) scored (pass/zone/fail) on the Gainful Employment Rule. Table 12 is a 3 x 2 contingency table because there are three levels in the variable 'score' and two levels in the variable 'program.' Table 12 also shows the total number of frequencies for all cells which is equal to 2,488.

Table 12

Contingency Table for RQ 3.3

Score	CBE Program? (yes or no)	Observed Frequency
Pass	Yes	77
Pass	No	1,969
Zone	Yes	8
Zone	No	269
Fail	Yes	2
Fail	No	163
		Total = 2,488

Once Table 12 was entered into the data view of SPSS, the researcher told SPSS that the data was weighted. “This process tells the computer that it should weight each category combination by the number in the column labeled Frequency” (Field, 2009, p. 693). The researcher then ran the chi-square analysis and obtained output for RQ 3.3. The output is described in Tables 14-18.

Table 13 of the SPSS output is the case processing summary. The case processing summary table shows that there were 2,488 records (N = 2,488). This equals the total frequencies found in Table 12, indicating that the data is complete.

Table 13

Case Processing Summary for RQ 3.3

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Score*CBE	2,488	100.0%	0	0.0%	2488	100.0%

Table 14 in the SPSS output is the crosstabulation. The crosstabulation contains the number of cases that fall into each combination of categories. There were 87 CBE programs (3.5% of the total N). Of these, two failed (2.3% of the total 87 CBE programs) the Gainful Employment Rule, 77 passed (88.5% of the total 87 CBE programs) the Gainful Employment Rule, and 8 (9.2% of the total 87 CBE programs) were on the border of pass/fail and thus were granted a zoning status. There were 2,401 non-CBE programs (96.5% of the total N). Of these, 163 failed (6.8% of the total 2,401 non-CBE programs) the Gainful Employment Rule, 1,969 passed (82% of the total 2401 non-CBE programs) the Gainful Employment Rule, and 269 (11.2% of the total 2401 non-CBE programs) were on the border of pass/fail and thus were granted a zoning status. These numbers can be read from the rows labeled ‘Count’ and the percentages can be read from the rows labeled ‘% within CBE’ in Table 14.

Also in Table 14, the researcher reviewed the rows labeled '% within Score.' This row explains the percentage of the scores (pass/fail/zone) that were CBE vs. not CBE. For all the programs that failed the Gainful Employment rule (165), there were 1.2% CBE programs and 98.8% non-CBE programs. For all the programs that passed the Gainful Employment rule (2,046), there were 3.8% CBE programs and 96.2% non-CBE programs. For all the programs that were zoned in the Gainful Employment rule (277), there were 2.9% CBE programs and 97.1% non-CBE programs.

An assumption of a 3 x 2 (fail/pass/zone x CBE/non-CBE) contingency table chi-square test is that the expected frequencies are greater than five. By looking at the 'expected count' rows in Table 14, the lowest is 5.8. Because this value exceeds five, the assumption has been met and the reader can assume the chi-square statistic in this dissertation is accurate. While the observed counts for one of the fields is less than five, the assumption is about the expected count only. Thus, the assumption is still met. The standardized residual shows the difference between the expected count and the observed count. The standardized residual is the error between the two counts and it can also be found in Table 14. The equation used to calculate a standardized residual can be found in Figure 10. For CBE-programs, for example, the expected count was 5.8 and the observed count was two. Two minus 5.8 is -3.8. The square root of the 5.8 expected count is 2.41. -3.8 divided by 2.41 equals the standardized residual of -1.6. All the standardized residuals can be found in Table 14. The standardized residuals act as z-scores, which is the "value of an observation expressed in standard deviation units" (Field, 2009, p. 796). 95% of z-scores lie within -1.96 and 1.96 on a normal distribution (Field, 2009). Because

all the standardized residuals in Table 14 are within these parameters (-1.96 and 1.96), there is nothing significant about the results.

Table 14

Crosstabulation for RQ 3.3

			CBE?		
			No	Yes	Total
Score	Fail	Count	163	2	165
		Expected Count	159.2	5.8	165.0
		% within Score	98.8%	1.2%	100.0%
		% within CBE	6.8%	2.3%	6.6%
		% of Total	6.6%	0.1%	6.6%
		Std. Residual	.3	-1.6	
	Pass	Count	1969	77	2046
		Expected Count	1974.5	71.5	2046.0
		% within Score	96.2%	3.8%	100.0%
		% within CBE	82.0%	88.5%	82.2%
		% of Total	79.1%	3.1%	82.2%
		Std. Residual	-.1	.6	
	Zone	Count	269	8	277
		Expected Count	267.3	9.7	277.0

Table 14 (continued).	% within Score	97.1%	2.9%	100.0%
	% within CBE	11.2%	9.2%	11.1%
	% of Total	10.8%	0.3%	11.1%
	Std. Residual	.1	-.5	
Total	Count	2401	87	2488
	Expected Count	2401.0	87.0	2488.0
	% within Score	96.5%	3.5%	100.0%
	% within CBE	100.0%	100.0%	100.0%
	% of Total	96.5%	3.5%	100.0%

$$\text{standardized residual} = \frac{\text{observed}_{ij} - \text{model}_{ij}}{\sqrt{\text{model}_{ij}}}$$

Figure 10. Standardized Residual Equation

The next table on the SPSS output reviewed by the researcher was the 'chi-square tests' which can be found on Table 15. According to Field (2009), the "Pearson's chi-square test examines whether there is an association between two categorical variables" (p. 696) and "whether the two variables are independent" (p. 697). In this case, the two categorical variables are the scores (fail/pass/zone) on the Gainful Employment Rule and whether the program is CBE or not (yes/no). If the significance value is less than .05, the researcher can reject the hypothesis that the variables are independent. In this case, the significance values are greater than .05. The significance value is .193 for the Pearson

Chi-Square, thus the type of program (CBE or not CBE) had no significant effect on the score (fail/pass/zone) on the Gainful Employment Rule. Also, the chi-square value is 3.287. With a degree of freedom of two, the critical value for significance with a probability of 0.05 is 3.84 (Field, 2009). Because the chi-square value is 3.287 and therefore below 3.84, there is no significant difference in CBE vs. non-CBE programs as it relates to scores on the Gainful Employment Rule in this data set.

Table 15

Chi-Square Test for RQ 3.3

	Value	df	Asump. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	3.287*	2	.193	.208
Likelihood Ratio	4.134	2	.127	.138
Fisher's Exact Test	3.087			.213
N of Valid Cases	2,488			

* 0 cells (0.0%) have expected count less than 5. The minimum expected count it 5.77.

Summary of Results for RQ 3.3.

To summarize the results on RQ 3.3, the statistical reporting of the results is x^2 (2) = 3.287, p > .005. In other words, there was no significant association between type of program (CBE or not-CBE) and score on the Gainful Employment Rule (pass/fail/zone) when examining the dataset using a chi-square analysis. The hypothesis for research question 3.3 (RQ 3.3-H1) was that job placement would be higher in CBE programs than traditional ones. This was not correct because there was no difference found among the variables.

Summary of Results for All Research Questions

This section serves to summarize the results of Chapter IV. In RQ1, the study sought to determine whether the May 2017 quality standards released by CBEN would help to decrease the likelihood of CBE failing again. The researcher reviewed an empirical collection of articles-turned-book by Grant et al. (1979) on why CBE failed initially, and then compared the reasons why it failed to the May 2017 CBEN standards to see if those reasons were addressed in the standards. The method used to answer this question was a rubric-based assessment. Two researchers used the rubric and the final averaged score was a 64.2% alignment. Using an academic grading scale from the United States, this scoring is equal to a D letter grade and indicates that the CBEN standards (May 2017) and Grant et al. (1979) are not well aligned. Thus, the new quality standards released by CBEN will not help to decrease the likelihood of CBE failing again as defined by Grant et al. (1979).

In RQ2, the study sought to determine what the policies and procedures were for assessment in CBE programs, and to see whether or not institutions were aligned with best practices. The variables of interest were the best practices in assessment, as detailed in Chapter II Table 2, and the institution's assessment processes. The method used to answer this question was qualitative. The researcher sought to understand where institutions align and do not align with best practices as it relates to performing assessments. Fourteen themes were identified during the qualitative interviews. The participating institutions were aligned with five best practice themes in assessment including the use of authentic assessments, rubrics, updating the assessments, requiring substantive interaction between student and faculty, and providing timely feedback to students. The participating institutions were semi-aligned with six best practices themes in assessment including reporting the reliability of their assessments, reporting the validity of their assessments, comparing traditional education to CBE, requiring multiple methods of assessment, measuring general education, and guarding against bias. The participating institutions were not aligned with three best practices themes in assessment including comparing assessments to job performance of graduates, providing statistical data to the public, and having faculty involved in the formative assessment process. To summarize, the institutions passed five best-practices, failed three best-practices, and somewhat passed six best-practices. Based on these results, there is room for improvement.

Finally, in RQ3, the study sought to review CBE's effectiveness by reporting on student outcomes including graduation (RQ 3.1), race/gender equity (RQ 3.2), and job

placement (RQ 3.3) compared to the same student outcomes from similar, traditional programs.

For graduation (RQ 3.1), the researcher gathered graduation data from IPEDS. Because CBE is a form of pedagogy, not an academic program, CBE programs are not uniquely coded in IPEDS. In addition, not all institutions are 100% competency-based, except for Western Governors University (WGU). Thus, graduation rates of WGU were compared to similar peer-institutions, as defined by characteristics similar to WGU in the NCES/IPEDS data center. Institutionally, WGU ranked 5 out of 6 for its percentage of degrees awarded compared to its total enrollment. WGU also ranked 5 out of 6 for its percentage of undergraduate degrees awarded compared to its undergraduate enrollment. Programmatically, WGU fared well. Compared to the other institutions, it was in second place for the number of business degree completers; in first for the number of information technology completers; and in first for the number of nursing completers. However, a lack of enrollment data could have off-set the results for RQ 3.1 as it relates to programs only. Thus, on the institutional-level, the graduation statistics of CBE were worse than traditional education. But, on the programmatic-level, the graduation statistics of CBE were better than traditional education.

For race and gender equity (RQ 3.2), the researcher provided a similar review of WGU to that of RQ 3.1. The researcher gathered data from IPEDS and reported both on institution-wide data as well as program specific data. In terms of institution-wide data, WGU ranked last (sixth place) in the race diversity statistic and third in the gender diversity statistic. In terms of program data for gender only, WGU ranked third for

business programs, fifth for information technology programs, and third for nursing programs. In terms of program data for race only, WGU ranked last in all major programs: business, information technology, and nursing. Thus, on the institutional-level and programmatic-level, race/gender equity was not higher in CBE programs than traditional ones. The results were mediocre for gender only programmatic data.

Finally, for job success information (RQ 3.3), the researcher reviewed Gainful Employment Data from the U.S. Department of Education to compare CBE programs to non-CBE programs as it relates to their passing or failing of the Gainful Employment Rule. A chi-square test for independence was run to test for association between the two categorical variables (program: CBE and not CBE) and (Gainful Employment Score: pass, zone, fail). The statistical reporting of the results for RQ 3.3 was $x^2 (2) = 3.287$, $p > .005$. In other words, there was no significant association between type of program (CBE or not-CBE) and score on the Gainful Employment Rule (pass/fail/zone) when examining the data using a chi-square analysis. Therefore, job placement was not higher in CBE programs than traditional ones.

Measuring these three different questions required three methods. However, all the questions in this dissertation were related to the overall purpose, which was to evaluate whether CBE is likely to be successful this time. Based on the results of RQ 1 (D), RQ 2 (needs improvement), and RQ 3 (not high institutional ratings in RQ 3.1 and 3.2; no significance in 3.3), the competency-based education movement will likely fail again. Having said this, please note that there were two positive/semi-positive results from RQ 3.1 and 3.2:

1. Programmatically, WGU fared well in terms of graduation rates in RQ 3.1. Compared to the other institutions, it was in second place for the number of business degree completers; in first for the number of information technology completers; and in first for the number of nursing completers.
2. In addition, in terms of program data for gender only in RQ 3.2, WGU ranked third for business programs and third for nursing programs. While this was not higher than traditional programs, it was a middle ranking (3/6).

Thus, on a program-to-program level comparison, CBE does appear to rate highly for graduation rates and in the middle on gender equity.

CHAPTER V – DISCUSSION

Summary of Findings

Measuring three different questions required three different methods. However, all the questions in this dissertation were related to the overall purpose, which was to evaluate whether CBE was likely to be successful during this current generation. For the purposes of this dissertation, success was defined as two or more research questions having positive or successful results. Failure was defined as fewer than two research questions having positive or successful results. Based on the results of RQ 1 (D grade), RQ 2 (needs improvement), and RQ 3 (not high institutional ratings in RQ 3.1 and 3.2; no significance in 3.3), the competency-based education movement will likely fail again. Having said this, please note that there was a couple of positive/semi-positive results from RQ 3.1 and 3.2:

1. Programmatically, WGU fared well in terms of graduation rates in RQ 3.1. Compared to the other institutions, it was in second place for the number of business degree completers; in first for the number of information technology completers; and in first for the number of nursing completers.
2. In addition, in terms of program data for gender only in RQ 3.2, WGU ranked third for business programs and third for nursing programs. While this was not higher than traditional programs, it was a middle ranking (3/6).

Thus, on a program-to-program level comparison, CBE does appear to rate highly for graduation rates and in the middle on gender equity.

Relationship to Theoretical Frameworks

The theoretical framework for the first part of the study (RQ 1) was Lewin's 3-Stage Theory of Change as well as Lewin's Force Field Analysis. In Lewin's 3-Stage Theory of Change, essentially there was a pattern that was occurring and people had negative feelings or notions about it. The first stage was to unfreeze the pattern and look at its problems that are making people have negative feelings toward it. The second stage was to change the pattern based on those negative feelings. This helped the pattern move to a changed state. The third stage was to re-freeze the pattern, with changes, into something new that has a standard operating procedure. The new standard operating procedure (the May 2017 CBEN standards) was supposed to ensure that the previous problems of CBE did not re-occur, and that the new pattern could be re-reviewed by people without those earlier negative attributes. Similarly, in Lewin's Force Field Analysis, some forces were driving CBE's success while some forces were restraining it. In order for change to occur, one force must be stronger than the other. If the driving force for CBE to be successful was more powerful than the restraining force for CBE to fail, then, according to the theory, CBE would survive this generation. If the restraining force, which was acting as a restriction to the success of CBE, was more powerful, then the current fifth generation of CBE would fail much like in generations prior. Due to the results of the study in RQ1, the new May 2017 CBEN standards do not appear to be an adequate standard operating procedure to ensure that the negative notions about CBE are resolved in order for the pedagogy to positively move forward.

The theoretical framework for the second part of the study (RQ 2) was Bigg's Constructive Alignment Theory. This was a theory of teaching that recommended teachers build curriculum with the outcomes first, and then design lessons and assessments around those outcomes (Biggs, n.d.). Using this theory, the outcomes must include a verb about something the student did to achieve an outcome (Biggs, n.d.). For example: the student would analyze, the student would develop, the student would construct, and more. Due to the results of the study in RQ2, the assessment practices do appear to be adequate in terms of alignment to outcomes but there are other areas of improvement needed in terms of alignment with other best practices.

Lastly, the theoretical framework for the third part of the study (RQ 3) was Christensen's theory of disruptive innovation. The theory is a market-based one. According to Christensen (1997):

> The theory explains the phenomenon by which an innovation transforms an existing market or sector by introducing simplicity, convenience, accessibility, and affordability where complication and high cost are the status quo. Initially, a disruptive innovation is formed in a niche market that may appear unattractive or inconsequential to industry incumbents, but eventually the new product or idea completely redefines the industry. (p. 1)

Most of the results about graduation (RQ 3.1), race/gender equity (RQ 3.2), or job placement (RQ 3.3) compared to the same student outcomes from similar traditional programs were not of any notation except the two bulleted data points below:

- Programmatically, WGU fared well in terms of graduation rates in RQ 3.1. Compared to the other institutions, it was in second place for the number of business degree completers; in first for the number of information technology completers; and in first for the number of nursing completers.
- In addition, in terms of program data for gender only in RQ 3.2, WGU ranked third for business programs and third for nursing programs. While this was not higher than traditional programs, it was a middle ranking (3/6).

Due to the results of the study, some areas of CBE may pass Christensen's theory of disruptive innovation while others will not. These are illustrated in Table 16 below.

Table 16

Results of RQ 3 Compared to Theoretical Framework

Section of RQ 3	Where data can be found	Does it pass Christensen's theory of disruptive innovation?
3.1 Graduation Data – Institution Wide	Table 5	No
3.1 Graduation Data – Institution Wide Undergraduates Only	Table 6	No
3.1 Graduation Data – Program Only	Table 7	Yes
3.2 Race and Gender Equity Data – Institution Wide	Table 8	No

Table 16 (continued).

3.2 Gender Equity Data – Program Only	Table 9	Maybe
3.2 Race Equity Data – Program Only	Table 10	No
3.3 Chi-Square Analysis	Table 15	No

Relationship to Conceptual Framework

The topic for this dissertation mattered because without practical, empirical research on CBE, the effectiveness of this educational platform would remain speculative instead of being guided by evidence. To tie the three research questions of the study together, a phenomenological conceptual framework was utilized to "understand shared experiences (RQ 1-3) in order to develop a deeper understanding about the features of a phenomenon (CBE)" (Creswell, 2007, p. 60). This was an appropriate and rigorous means for the study because all the questions sought to better understand CBE's features as well as its vitality in American higher education today. RQ1 reviewed its history to determine whether the same mistakes CBE made in the past would continue today. RQ2 reviewed assessment practices of CBE programs which are critical to ensure quality. And, RQ3 reviewed the outcomes of CBE to understand whether the promises of the educational platform had come to fruition. The results of this study have provided a description of the lived experiences of CBE. By reviewing the results of this study, higher education professionals will be able to develop practices or policies to better ensure the effectiveness of competency-based education. The results of the study could also help

administrators decide whether or not they want to develop CBE programs. These professionals are encouraged to read the final implications of this study detailed below.

Final Implications

The first major implication is that the CBEN standards (May 2017) are not where they need to be in order to ensure current competency-based education programs do not fail to the same reasons previous generations of CBE programs have. Should an institution wish to pursue CBE, it should be understood that the institution should follow the CBEN standards (May 2017); but it should also be understood that the institutions must create their own standards, as needed, to better ensure the likelihood of success. A review of Table 3's unsatisfactory (1) scores in Chapter III reveals where new programs will need to invest in their own success because the CBEN standards are not helpful. Another option is that the Competency-Based Education Network could use this research to edit the May 2017 version of the standards in order to be more in line with the results of this study.

The second major implication is that the assessment practices of current CBE programs could use improvement. While some of the programs are doing excellent work as it relates to best practices in assessment, there are particular themes of assessment that are considered best practices that the programs are either not following or not following completely. Table 5 in Chapter III provides indication of where CBE programs lack alignment to best practices in assessment. Should an institution wish to pursue CBE, they should consider working with other CBE institutions to determine ways in which they can better align their processes with best practices. Working with other institutions may

ensure the success of CBE as a whole, and not just the success of one CBE program; a future Delphi method study to review the best practices where there was no alignment or only some alignment could be helpful with this process.

The third major implication is that institution-wide data for graduation rates and race/gender equity are not impressive when comparing a CBE institution to a non-CBE institution. That being said, program-wide data for graduation rates are more impressive and gender equity for program-wide data are mediocre. Thus, should an institution wish to pursue CBE, they should highlight these successes. In addition, job placement data for CBE and non-CBE programs is not impressive when comparing a CBE institution to a non-CBE institution. Thus, should an institution wish to pursue CBE, career centers at CBE institutions should focus more attention on the placement of graduates to ensure better outcomes.

Recommendations

This dissertation topic mattered because without practical, empirical research on CBE, the effectiveness of the educational platform would remain speculative instead of being guided by evidence. This dissertation has added important literature to the research on competency-based education, and several recommendations are bulleted below:

- The Competency-Based Education Network should revise their May 2017 standards to better ensure the success of current CBE programs because their standards are not well aligned with the reasons for past CBE failures.
- Current CBE programs should review areas where their programs lack following best practices in assessment. These areas may include reporting the reliability of

their assessments, reporting the validity of their assessments, comparing traditional education to CBE, requiring multiple methods of assessment prior to marking a student at the mastery level, better measuring general education, guarding against bias in assessments, comparing assessments to job performance of graduates, providing statistical data to the public, and having more faculty involved in the formative assessment process.

- Current CBE programs should highlight their progress on graduation rates (and possibly gender equity) as it relates to other programs. Current CBE programs should work on creating a more inclusive environment for all races. Current CBE programs should ensure their career centers are placing students into jobs post-graduation.
- Finally, IPEDS should create a way to better compare CBE vs. non-CBE programs in their data system.

Final Limitations

"Limitations are potential research weaknesses that are mostly out of the researcher's control, impacting the interpretation of research findings, because of, e.g., research design, statistical constraints, and access to audiences or data" (Young, 2016a, p. 1). In Chapter I, limitations recognized prior to completion of this study can be found. In this final chapter V, limitations found during the completion of the study are noted. The Chapter V limitations are noted in the case that future researchers wish to complete a similar study. The limitations listed in this chapter may help future researchers design a stronger research study. In RQ1, the researcher focused on answering the research

question regarding the alignment between the May 2017 CBEN standards and the Grant et al. (1979) study. Another researcher may be interested in reviewing the rubric's indicators and whether they are predictive or not to ensure higher inter-rater reliability. Another researcher may also be interested in increasing the sample size for RQ1 from only two participants to many more. In RQ 3.1, IPEDS enrollment and graduation data from the exact same term was not available. A future researcher may want to wait until data from the same term is available or back-date the data to obtain enrollment and graduation numbers from the same term. Also in RQ 3.1, IPEDS enrollment data by major was not available. This could have biased the programmatic graduation results. A future researcher may wish to gather primary data (not the limited secondary data available from IPEDS) to answer this question. Finally, in RQ 3.3, all majors were grouped together into CBE/non-CBE due to small sample sizes by major and a chi-square analysis that does not permit matching. This could have created too generalized of results. A future researcher may wish to gather a larger sample size for RQ 3.3 or use a different statistical analysis so that the research question can be answered by major, not just CBE vs. non-CBE.

Change of Governance and Legislation

The social problem explained in Chapter I was that higher education is not doing what it needs to do to solve societal problems of: low degree attainment and issues of equity; institutions not aligning programs to job market; low and slow graduation rates; high tuition; and poor academic quality. This social problem was illustrated in Figure 2 in Chapter I. Many of the pressures that higher education was under were from former

President Obama's administration. During the writing of this dissertation, a change in United States Presidency occurred. The current President is now Donald Trump. President Trump is of a different political party (Republican) than Former President Obama (Democrat), and also has different ideas about the governance of higher education. Because of this, many of the pressures on higher education discussed in Chapter I may either go away or change. The reduction of the budget for higher education funding, the change of tax law, the focus on vocational education, the new leadership at the Department of Education, the elimination of Former President Obama's gainful employment rule (as well as other rules for for-profit colleges), and the introduction of a bill to overhaul the Higher Education Act of 1965 will all impact higher education during President Trump's tenure. As explained in Chapter I, competency-based education was a way in which colleges and universities were responding to the pressures for change in higher education. However, if those pressures change, competency-based education may change, too.

According to the Pew Research Center (2017), Republicans increasingly believe that higher education is having a negative impact on the country. A 2017 Gallup Survey mirrored these results and found that Republicans have little confidence in higher education (Newport and Busteed, 2017). With Republicans holding the majority of the current 114th United States Congress as well as control of the Executive Branch, changes are likely underway for higher education. Despite this, a bipartisan bill for competency-based education again exists. As explained in Chapter II, one existed in 2014 and another

exists now. In June 2017, the new bill hoped to do the following according to Fain (2017b):

> The Advancing Competency-Based Education Act of 2017 proposed legislation would require an annual evaluation of each competency-based education program in the project to measure quality, student progress toward degrees, and their ability to pay off loans and find employment after graduation. It also would require accrediting agencies for participating institutions to set standards for competency-based education. (p. 1)

Thus, higher education professionals must watch to see how President Trump and the Republican's impact on higher education (as well as this bill) will affect competency-based education.

Conclusion

In conclusion, CBE has been around since the late 1800s, but has recently served as a revamped pedagogy designed to respond to some of higher education's most pressing issues today: low degree attainment and problems of equity; lack of alignment between education and job market; low and slow graduation rates; high tuition; and poor academic quality. Despite the promises of CBE to respond to these issues, the new pedagogical approach lacked much empirical data. The researcher provided a summary of current research on CBE and identified gaps in the literature. Three gaps were identified including why CBE had failed in the past (and how that information was being used today in the May 2017 CBEN standards), literature on assessment practices (and how institutions are or are not using best practices), and reporting on outcomes including

graduation, race/gender equity, and job placement compared to traditional programs. These three gaps led to the creation of three research questions directed by three theoretical frameworks, as well as one conceptual framework to tie the study together. The research questions were addressed using multiple research methods. However, all the questions in this dissertation were related to the overall purpose, which was to evaluate whether CBE was likely to be successful this time. For the purposes of this dissertation, success was defined as two or more research questions having positive or successful results. Failure was defined as fewer than two research questions having positive or successful results. Based on the results of RQ 1, RQ 2, and RQ 3.1-3.3, the competency-based education movement will likely fail again. There are, however, areas of opportunity. Some of the programmatic outcomes in RQ 3.1 and RQ 3.2 were mediocre to positive. In addition, the CBEN standards in RQ 1 could be adjusted and the best-practices in assessment in RQ 2 could be better followed to ensure CBE does not fail. While the results may be disheartening to leaders of CBE, recommendations of this dissertation have been noted to change the route of the current CBE movement. Finally, President Trump's initiatives as well as the bipartisan support of CBE in the legislature could make a difference to CBE, too. This dissertation topic mattered because without practical, empirical research on CBE, the effectiveness of this educational platform would remain speculative instead of being guided by evidence. This dissertation has added important literature to the research on competency-based education. It measured the CBEN's May 2017 quality standards, current assessment practices, and

outcomes/effectiveness of competency-based education using mixed methods to determine CBE's vitality in today's higher education market.

APPENDIX A – Screenshots of Competency-Based Education Programs

Example 2 Explained

Figure 1 in Chapter I was the first example of what a competency-based education program might look like. Figure 11 below is the second example. This is an example from Southern New Hampshire University's College for America and the software they use is Canvas (Straumsheim, 2014). When a student logs in to the system, they are presented with their activity feed. Figure 11 is what displays when a student logs in. On the first tab of their activity feed, the student can see what competencies are in progress. When they click into a particular competency from those in progress on their activity feed, they can see learning resources and assessments (not shown in Figure 11). At the top of Figure 11, a progress bar displays indicating how far along the student is toward degree completion.

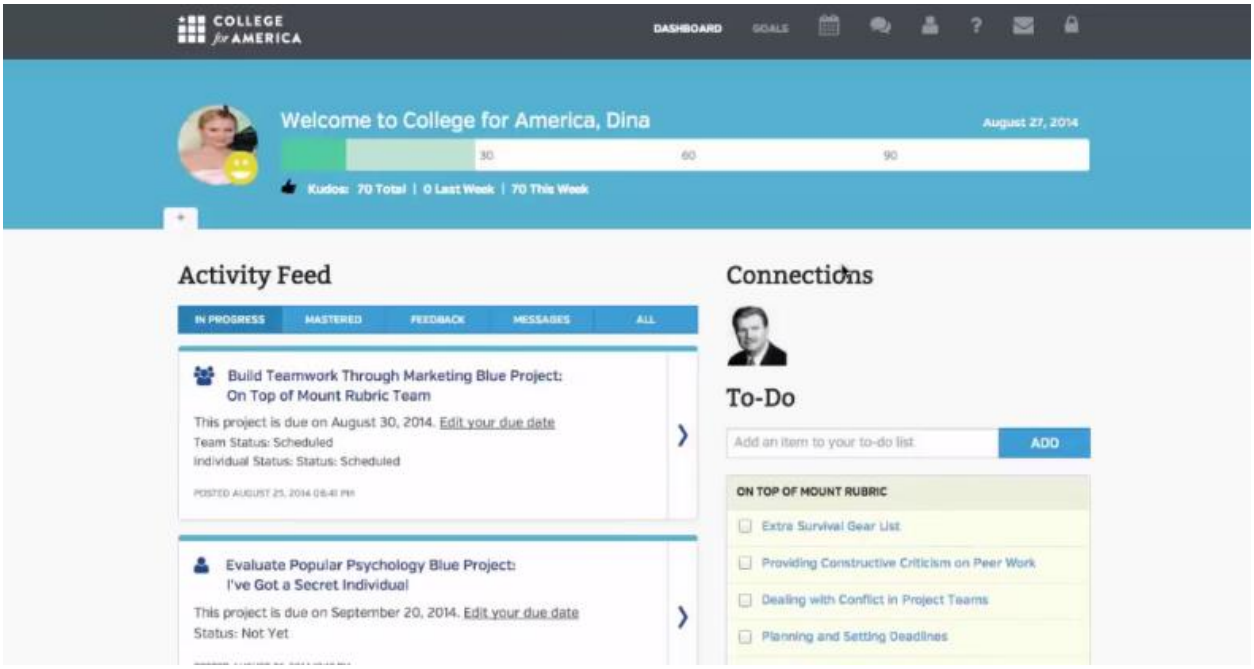

Figure 11. Screenshot of Competency-Based Education Program at College for America

Reprinted from *Inside Higher Ed*, by Straumsheim, 2014, Retrieved from https://www.insidehighered.com/news/2014/09/29/college-america-spins-its-custom-made-learning-management-system.

Example 3 Explained

Figure 12 is the third example of what a competency-based education program might look like. This is an example from a learning management system called Motivis Learning (2017). Motivis is a company that offers institutions ways to manage their competency-based education programs; it is not an institution itself. Figure 12 shows what a competency-based program looks like from a student perspective. When a student logs in to the Motivis system, they are presented with their current assignment. Figure 12 shows a competency about wireframing. The first link includes the learning resources for the student to review about why they should create a wireframe. Once the student feels comfortable with their knowledge of the learning resources material, they can move on to the third link which includes their formative assessment. After the student takes a practice

exam, they can move on to the summative assessment found at the second link. Once the student has successfully completed those summative assessments about wireframing, they can move on to their second group of competencies about responsive websites.

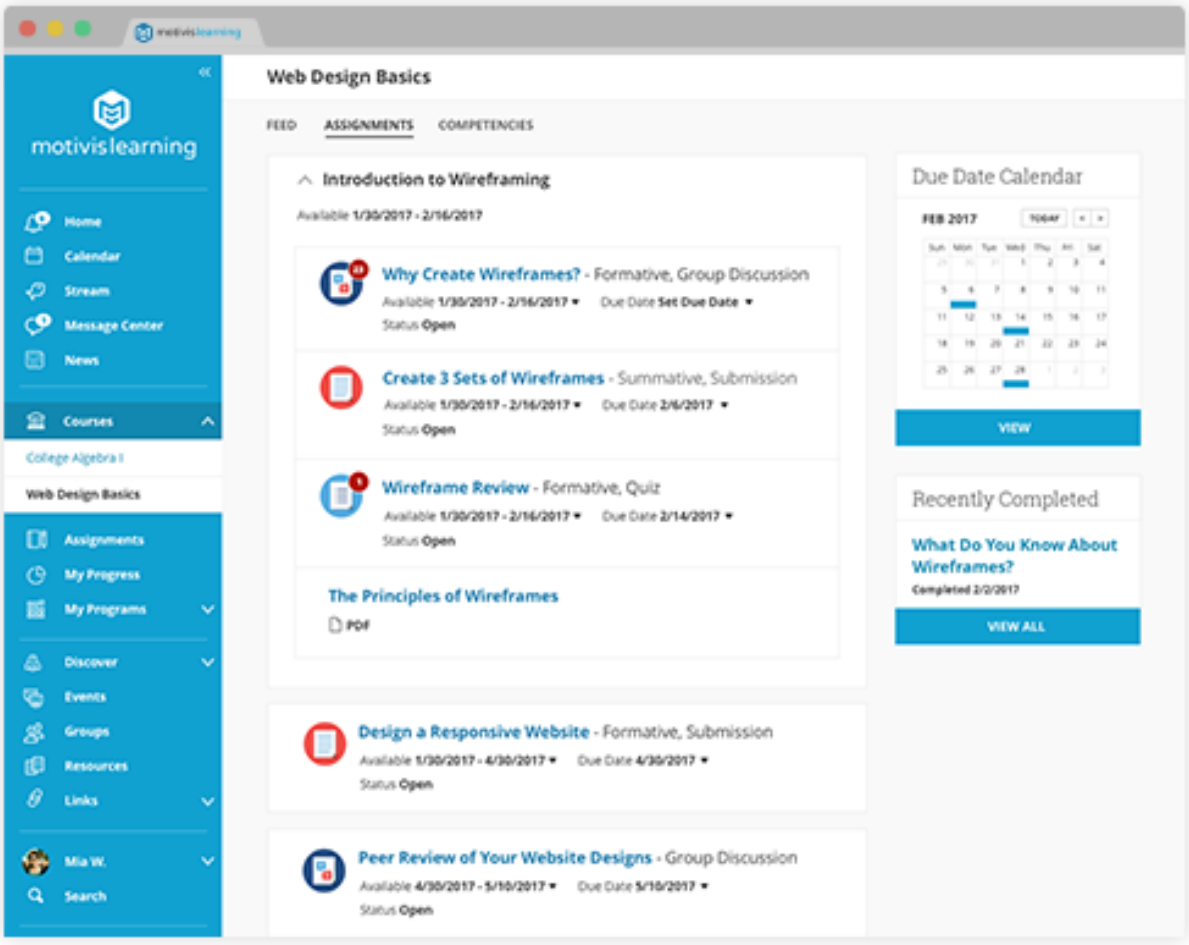

Figure 12. Screenshot of Competency-Based Education Program from Motivis Learning

Reprinted from Motivis Learning, n.d., Retrieved from https://motivislearning.com/solutions/learning-management-system/.

APPENDIX B – Current Research on CBE that Led to Researcher's Understanding of the Gaps in the Literature

Introduction and Purpose of the Appendix

The existing, published research on CBE can be divided into four subcategories: 1) research on program development, 2) research on implementation and outcomes, 3) research on perceptions, and 4) case study research on particular CBE programs. To ensure reader flow, these subcategories of research were not detailed in Chapter I. Instead, they are found here in Appendix B below.

Subcategory 1: Research on CBE Program Development

CBE models.

Much of the research available on CBE is about program development. First, it is already well understood that CBE does not rely on the Carnegie Unit. There are essentially two CBE models funded by the U.S. Department of Education: "either the course-based with credit equivalency CBE model or the direct assessment model" (Book, 2014, p. 3). The course-based with credit equivalency model is set when institution's "academic teams translate competencies into topics that can be formulated into courses of the appropriate length and complexity" (Johnstone & Soares, 2014, p. 17). The direct assessment model is "untethered from course material and credit hour. It is when learners demonstrate competencies, particularly mastery, at their own pace, typically online, and progress through academic programs when they are ready to" (Book, 2014, p. 4). All CBE programs thus far follow one of these two models.

Research about the direct assessment model in particular indicates it creates disconnects with credit-bearing programs because there are inconsistent metrics, a lack of

transparency about what credentials represent, and limited transferability to credit-bearing institutions (Ganzglass, Bird, & Prince, 2011). Because of this, there are already policy statements by accrediting bodies, such as the Southern Association of Colleges and Schools Commission on Colleges, that help programs streamline so there are less issues with this CBE model (Direct Assessment, 2016). Because of this, there are also resources to help in the design of direct-assessment programs, too (Brower, Humphreys, Karoff, & Kallio, 2017).

Process of program creation.

Another area of CBE program development research that has been addressed is the process of CBE program creation. McIntyre-Hite (2016) wrote about effective practices in CBE development using a Delphi study; Klink, Boon, and Schlusmans (2007) wrote about the pedagogical characteristics of CBE and program design methods; Knott (1975) wrote about organizing CBE curriculum; Knaak (1977) wrote about creating CBE models for vocational programs; Hastings (2017) wrote about designing CBE courses around standards; and Adams et al. (2015) from the Education Advisory Board produced a play-book for creating a CBE program.

The American Institutes for Research (AIR) wrote about how faculty and administrators can make a case for the creation of CBE on their college campuses, based on lessons from early adopters (Soldner & Parsons, 2016). Several ways AIR suggested making a case includes showing that the program was created in a data-driven manner and has sustainability (Soldner & Parsons, 2016). Soldner and Parsons (2016) from AIR also suggested providing research to compare CBE programs to similar traditional programs:

> AIR has developed a descriptive rubric that assists practitioners in describing 18 key elements of CBE programs, including how learning outcomes and competencies are developed, how courses or competency units are structured, and how the various faculty and learning support roles that exist within programs are structured. (p. 3)

Themes of program development.

The common themes that arise when reading about CBE program development is that CBE programs should have clear, robust, valid competencies; students should be able to learn at their own pace; learning resources should be available at any time; program competencies should be well-mapped to assessments; and assessments should be reliable (Johnstone & Soares, 2014). Management, accreditation, and financial aid structure should also be taken into consideration (Rowen, 2015), and ensuring strong leadership and vision as well as rethinking staffing is important as well (Klein-Collins, 2012). A survey from *Competency Works* supports all these ideas, including the recommendation that administrators of institutions remember to engage business processes during development (with 97% of survey respondents finding this important) and strive to build a program that is learner-centered (with 100% of respondents finding this important) (Wax, 2015c). Wax (2015a) said survey results indicated that the following were mentioned as the biggest challenges to CBE development: "lack of expertise in CBE frameworks, marketing and outreach, student engagement and persistence, lack of technology, faculty resistance, and sustainability" (p. 1). Other articles such as one by Wright (2016) listed other challenges such as accreditation obstacles, lack of common language in CBE, financial aid, and policy-makers.

How to create CBE programs by academic major.

Despite the current obstacles, there are already many colleges pushing forward with CBE and there are several articles about how to create a CBE program by academic major or degree. Dragoo and Barrows (2016) wrote about how to design a CBE business program; Gomez and Berrocoso (2012) described how to design a CBE accounting program; Ippercial and El Atia (2014) wrote about building a CBE program that assesses competencies of graduate-level students; Rivenbark and Jacobsen (2014) discussed the design of CBE programs for a Master of Public Administration and Policy; Lasse (2012) wrote about creating a CBE program for someone who wants to be employed in sales; and Ott, Baca, Cisneros, and Bates (2014) wrote about how to design a CBE higher education administration program.

CBE can be utilized for many types of programs including K-12, associates, bachelors, masters, doctorate, certificates, and micro credentials such as digital badges. However, Phillips (2016) said that the programs that could be most effective are those that already have pre-determined professional outcomes or those programs where students must take a licensure examination: for example, nurses and teachers. CBE may be more effective for these programs both because the competencies are clearly distinguished but also because the assessment (i.e.: licensure exam) has been created, and the assessment lays the foundation for what is expected of the graduates from these programs.

Resources to help with program development.

In addition to this research on the creation of CBE, there are conferences that help institutions design CBE programs based on these best-practice themes; one is presented

by the Competency-Based Education Network (CBEN) and another is presented by Academic Impressions. In addition, CBEN, the professional association for institutions that offer CBE, also created voluntary standards for institutions to follow when developing CBE programs. These standards are called *Quality Principles and Standards for Competency-Based Educational Programs* (2017). The purpose of the standards was to define what a quality CBE program is, as well as to influence policymakers and accreditation bodies in their regulation of the field. The CBEN standards were released in draft form in October 2016 and the final version was released in May 2017. There are eight standards, all of which are detailed in Chapter II.

Assessment.

Another area of research in CBE program development is about assessment. Many reports recommend how to build and structure the assessments of a CBE program during its initial program development. Dwyer (2016) and Holmboe et al. (2010) wrote about designing an assessment program for medical CBE programs. Borin, Metcalf, and Tietje (2010) wrote about creating assessments for a CBE marketing program. Wolfe (2008) reviewed whether a CBE performance-based assessment had appropriate cut off scores for competence and mastery by comparing scores to a medical doctors' level of experience on the job. Fastre, Van der Klink, Amsing-Smit, and Van Merrienboer (2014) reviewed different CBE nursing assessment criteria. Tsai (1992) looked at the effectiveness of the plumbing competency test in China. He found that some competencies defined on the test needed revision from plumbing supervisors to better align to the actualities of employment. Tsai (1992) also recommended that China create a national organization that reviews licensure-ridden tests for reliability and validity, such

as how the United States uses the National Occupational Competency Testing Institute to check many assessments prior to implementation. Finally, on a more comprehensive level, the Association of American Colleges and Universities created a rubric for essential learning outcomes of all undergraduate students (Maki, 2015). While not specifically for CBE programs, some institutions that have CBE, including Brandman University and Salt Lake Community College, use it (Maki, 2015). The rubric is called the VALUE Rubric.

McClarty and Gaertner (2015) from the American Enterprise Institute's Center on Higher Education Reform were broader; they wrote about best practices for measuring mastery in CBE programs regardless of major and recommended creating tests based on external measures for increased validity. Rowen (2015) said CBE programs should have multiple measures of competency and that the assessments should take on many forms including multiple choice tests, presentations, essays, and performance-based measures. McDonald (1976) recommended administrators define how they want their graduates to be after they graduate from a CBE program, and then build an assessment system around those identified criteria.

Change of faculty role.

Additionally, another area of research in CBE program development explores the change of a faculty members' role from a lecturer to a coach or an assessor. This is one of the features that makes a CBE program unique. Newbold et al. (2017) reviewed three different CBE institutions and their faculty roles; one of their recommendations was to identify faculty best suited for CBE prior to hire by choosing those willing to adapt to new teaching philosophies. Bettinger and Baker (2011) found that students who were

assigned academic coaches persisted at an institution longer than those who were not assigned an academic coach. A key reason cited for this positive benefit is that faculty as coaches help to build stronger relationships between the faculty and the student, helping both inside and outside the classroom (Seifert & Chapman, 2015). This new role of faculty comes with challenges including redesigning the faculty tenure and promotion process. Advocates for faculty as coaches have presented at conferences to showcase different coaching models as well as to help higher education professionals re-think the traditional faculty role (Denton, 2016). Critics argue coaching eliminates subject matter experts of faculty and increasingly relies on faculty in part-time positions (Seifert & Chapman, 2015).

Another role faculty may increasingly play at CBE institutions is one of an assessment coordinator. Garrett and Lurie (2016) surveyed active CBE programs about what the largest role of the faculty was at their institution. Garrett and Luire (2016) reported that the following roles were completed by faculty in order of most prevalence to least prevalence: assess students, develop assessments, design instructional content, direct instruction, program evaluation, generate/refine competencies, mentor students, develop new competencies with employers, work with support teams, and train other faculty on CBE.

Pérez and Clem (2017) did a case study on a Chilean University that offered CBE. In their research of 22 faculty, they found that faculty did not fully understand their CBE programs and that, because of this, the CBE program was beginning to re-morph into a traditional program.

Technology needs.

Moreover, another area of research regarding CBE program development is regarding technology needs. In a survey by EDUCAUSE, Higher Education's leading resource for technology innovation, it was found that 79% of CBE administrators thought there were "significant technical issues or inefficiencies managing CBE-related processes and information using current systems" (Leuba, 2015, p. 1). A survey found similar results and stated that 78% of institutions surveyed think the lack of technological capacities hinders the establishment of successful CBE programs (Garrett & Lurie, 2016). Thackaberry (2016) stated the following:

> The systems we need will be aligned to competencies at multiple levels, backed by robust learning object repositories, support diagnostics, different types of formative and summative assessments and integrated micro-assessments, assume use of video and be interactive, and will be mobile-first. They will have integrated degree maps and social capabilities to structure support learner-to-learner as well as for a variety of distributed faculty roles. (p. 2)

A report released by CBEN tries to address this by acting as a resource for information technology professionals. Entitled "Questions Information Technology Professionals Should Ask About Competency-Based Education Programs" (2016), this resource acts as a guide so CBE programs may have better technological success at their institutions. Mott, Williams, Atkinson, and Ceglia (2017) as well as Kevan (2017) also focused on information technology architecture for a CBE program in their research.

Educational platform.

A final area of research regarding CBE program development is the educational

platform. CBE can be offered face-to-face, online, or hybrid, but most higher education CBE programs are online (Book, 2014). Garrett and Luire (2016) also reported that CBE can be used amongst a wide variety of educational programs. In their survey of institutions, 14% were associate degrees, 13% were bachelor's degrees, 6% were master's degrees, 1% was a doctoral degree, 17% were certificate programs, 25% were unreported because they were in the planning process, and 40% did not intend on creating a CBE program.

Subcategory 2: Research on CBE Implementation and Outcomes

The second subcategory of research on CBE is about its implementation, outcomes, and evaluation of the program. This category of research includes specific processes for executing CBE (implementation), recording initial results of CBE (outcomes), and determining how the CBE program can be reviewed (evaluated) for continuous improvement.

Implementation of a program.

Regarding implementation, there is research on CBE's target audience and transcripts.

Target student population.

Regarding target audience, CBE is an effective educational platform for many diverse learners (Sullivan & Downey, 2015) but the direct assessment CBE model may work best with self-directed, adult learners because it has been designed for them. Current statistics from multiple institutions including Western Governors University, Southern New Hampshire University, and the University of Phoenix suggest CBE's

demographics are non-traditional students (Ordonez, 2014).

Because of this, critics argue that CBE will only further stratify higher education. This could happen in two ways. First, those who enroll in CBE are usually attracted to it because they can use their knowledge from the field to get credit. Thus, CBE is best for those already in the workforce. A different argument is that CBE will stratify society in the sense that the elite will continue to go to liberal arts colleges while the lower-to-middle class will attend a CBE program which, as of now, has not proven its quality (Ward, 2016). Schejbal (2014) explained:

> Competency-based education is not a panacea that will save higher education, but no one claims that it is. It is one approach to higher education that expands students' options for learning and most importantly, expands their access while focusing on what they know and are able to do instead of focusing on how many hours students spend in a classroom or the number of credits they pay for.

Transcription.

Another area of implementation research is about transcription. The American Association of Collegiate Registrars and Admissions Officers (AACRAO) refers to a CBE transcript as an *extended transcript*. Twelve institutions are currently testing the extended transcript as part of the Comprehensive Student Record Project (Kilgore, 2016; Fain, 2015a). The extended transcript is different than a traditional one. While a traditional transcript has the name of courses, credit hours, and grades, the extended transcript includes outcomes the student learned. The extended transcript was made to be more relevant because, currently, "employers use the traditional transcript to solely verify the degree and discard any other information" they find no need for (Shendy, 2016, p. 7).

Research indicates that, so far, students are liking this new type of extended transcript. The University of Maryland University College implemented their extended transcript on a pilot of 2,000 students. Eight hundred of those students opened the document. Of those 800, 70% of students found the document useful and 84% believed the extended transcript should be implemented University-wide (Shendy & Bream, 2017).

Outcomes of a program.

Regarding outcomes, there are several areas of research including time to completion, cost, graduation/employment rates, and a review of historical CBE programs amongst the literature.

Time to completion.

One of the goals of CBE is to take less than four-years to complete a Bachelor's degree. Advertisements for CBE programs focus on one or two graduates who finished their CBE program in record time (Adams et al., 2015, p. 26). For example, Zach Sherman, who attended Southern New Hampshire University's College for America, completed his associates degree in three months and five days (Kamenetz, 2013). However, a report from the Education Advisory Board said these students are the exception because only 10-15% of CBE students accelerate in their CBE program about this fast, and most students in CBE finish at about the same time as traditional students or slower (Adams et al., 2015, p. 28). A report by the American Association of Institutional Researchers found the average pace of CBE students to be between 3% less fast than traditional students to 42% more fast than traditional students (Parsons, Mason, & Solder, 2016). Having said that, Bachelor's degree graduates from the CBE program at the

University of Wisconsin finish in about 2 years (Sandeen, 2016).

Cost.

Similarly, another goal of CBE is to be less expensive than a traditional program. Some CBE programs charge a flat-rate for the degree while others charge students for every four or six-months enrolled at around $3,000 for that time period (Zalaznick, 2014). “On average, it takes about three years to get a Bachelor’s degree from Western Governors University, which would cost about $18,000” (Zalaznick, 2014, p. 45). To date, there are a couple of articles about CBE’s cost. Desrochers and Staisloff (2016) found that CBE programs in the long run are 50% less expensive to run than traditional programs. At the same time, Adams et al. (2015) reported that CBE is a not lower cost for the institution or the student due to the administrative complexities of CBE. He claimed that in the traditional model of education, the faculty salary is roughly $250 per student. In the CBE model with both the faculty salary and coach salary, their salaries are roughly $283 per student. Adams et al. (2015) also stated that if CBE students do not graduate as fast as their programs claim they can, then the cost can be about the same as traditional programs. Lectures at different conferences can help institutions create staffing and cost models (Staffing and Cost Models, 2016).

Graduation and employment rates.

Another area of research regarding CBE outcomes is graduation rates and employment. In a study of one junior college, Konkoth (2016) found that there was no statistically significant difference in graduation rates of traditional students and CBE students; she did find, however, that CBE students were more likely to be placed into

jobs.

Comparison to traditional programs.

Another area of research regarding CBE outcomes is quality as compared to traditional academic programs. A study by Fan et al. (2014) found that students in CBE programs had significantly higher academic performance than those from traditional programs. In a study of CBE in the K-12 system, Findley (1981) found that students who graduated in 1976 under traditional graduation requirements and students who graduated in 1977 under minimum competency graduation requirements did not necessarily perform better on the competency tests. Findley (1981) stated the results.

When the overall findings of this study were reviewed, it did not appear that student achievement under the newly established minimum competency graduation requirements was superior to that of students who went through the regular instructional program in which no competency tests were required. (p. 94)

Another study of quality compared to traditional education was by Morcke, Dornan, and Eika (2013). These researchers sought empirical evidence for CBE's quality as it relates to medical education. Their findings were that CBE is helpful in defining knowledge, skills, and assessment, but is less helpful for complex clinical exercises.

Garrett and Lurie (2016) surveyed CBE institutions that also offer traditional programs regarding a comparison of outcomes. Garrett and Lurie (2016) reported that 6% of institutions say their CBE programs are much better on learning outcomes and completion rates than their traditional offerings. 11% said somewhat, 26% said about the same, 53% said varies by program, 3% said CBE is somewhat worse, 0% said it is much worse, and 3% said other (p. 26).

Rivers and Sebesta (2017) surveyed graduates of a traditional program at Texas A&M University Commerce and a CBE program at Texas A&M University Commerce. One hundred and one students were surveyed. In most of the results, the CBE students were more positive about their outcomes than the traditional students. 86% of CBE students were very satisfied with their education while only 62.50% of traditional students were (Rivers and Sebesta, 2017). 78% of CBE students felt like they had substantive interaction with faculty, while only 42% of traditional students felt the same way (Rivers and Sebesta, 2017). Roughly 90% were employed from both programs (Rivers and Sebesta, 2017). About 40% in both groups received an increase in income after graduation, with the CBE students getting a promotion while the traditional students found work at a new employer (Rivers and Sebesta, 2017).

Review of historical CBE programs.

A final area of research regarding CBE outcomes is why the system failed in the past. CBE is not new. It was initiated in the 1960s (and, some argue even from the late nineteenth-century) (Gallagher, 2014). With the implementation of more technology, CBE has again become a hot-topic. Researchers point to several reasons for its initial failure. Ford (2014) with the University of Maryland University College Center for Innovation in Learning and Student Success, said the CBE programs of the past failed because they were too focused on vocation, were found to be contentious, were uncoordinated, were too conceptual and not operational, and they lacked valid assessment tools and methods of evaluation. Ford (2014) also predicted the following problems with the current generation of CBE: complexity of alignment, institutional acceptance, shared governance barriers, lack of agreement across campus, concerns by faculty regarding

assuming the new role as academic coach, degree portability, too many standardized tests, faculty training in assessment, and the ability to prove the reliability and validity of assessments.

Another researcher reflected on CBE programs of the past as well. Gallagher (2014) stated that CBE is being marketed as a radical break from traditional education, but that it is indeed not anything new. He says, regardless of how administrators spin it, "CBE fundamentally remains what it always has been: an individualized approach to education in which students demonstrate the acquisition of predetermined competencies, typically in a self-paced manner and through performance assessments" (Gallagher, 2014, p. 18). Gallagher (2014) stated that the reason for its failure in the past is that it does not align well with the purpose of higher education and that, to date, no researcher has reliably found that CBE works better when compared to traditional programs. He also pointed to research published in the 1970s about why CBE had failed then. Gallagher (2014) stated:

> A three-year FIPSE-funded (Fund for the Improvement of Post-Secondary Education) study of CBE programs revealed many problems with the CBE programs it observed: high drop-out rates, poor student self-monitoring, lack of institutional preparation, inadequate institutional leadership, excessive bureaucratization, higher-than-expected costs, routinization/atomization/codification of competencies, and more. (p. 20)

Gallagher (2014) said that, "those who promote it today would do well, first, to acknowledge that CBE has a history, and second, to study this history to avoid or transcend the limitations and problems that have attended its implementation in the past"

(p. 21). He indicated that he already sees the CBE programs of today failing in equity, lack of group interaction, undermining of faculty qualifications, and too many narrow competencies (Gallagher, 2014).

Program evaluation.

The last area of research from this subcategory is how to evaluate a CBE program. In one article, Gaudet, Annulis, and Kmiec (2008) used the Phillips five-level return on investment framework to measure the impact of the CBE program on the graduates' job as well as value-added. Krause, Dias, and Schedler (2015) proposed a rubric to measure whether a CBE course is of quality. Ozdemir and Stebbins (2017) provided a framework for CBE program review and tested that framework on a Master of Healthcare Administration program.

Subcategory 3: Research on People's Perceptions About CBE

The third subcategory of research on CBE is the faculty, administrator, student, and employer perceptions about CBE after its implementation.

Faculty perceptions.

Jones (2015) researched health care faculty (from schools with memberships in the Association of University Programs in Health Administration or accredited by the Commission on Accreditation of Healthcare Management Education) perceptions about CBE and found that 75.5% of faculty think CBE prepares graduates for success in the workplace. Additionally, 58.3% believed CBE as an educational framework positively influenced their students' quality of education. Having said this, Jones (2015) did find faculty had some areas of concern. Faculty members stated they "need more

standardization of the competencies and/or a single model for all programs to use" (Jones, 2015, p. 153). They also stated they were "unsure the competency approach translated into workplace success and were unsure competencies are based on student/employer needs" (Jones, 2015, p. 153). Reynolds and Sharpe (1992) found, via survey, that academic faculty were more negative toward CBE than vocational faculty. Using a pre-and post-test design, Klein-Collins (2016) measured whether 463 faculty perceptions changed after training on what CBE was. She found that some did, but not many.

Administrator perceptions.

Administrator beliefs or perceptions about CBE have also been researched. A survey of college and university presidents by the Chronicle of Higher Education found that 44% thought CBE is only appropriate for particular programs, while 34% say CBE should be for all students and all programs (A New Measure, 2015). The reason for these low numbers, per the article, is that the presidents believed CBE would work best for students who already have some work experience because they could apply that knowledge to the classroom. Seventy-one percent of those surveyed thought education should not be tied to the credit hour/time in classroom (A New Measure, 2015).

Student perceptions.

Student perceptions of CBE have also been researched. Bell and Mitchell (2000) compared a traditional student cohort to a CBE student cohort. They found that the traditional cohort thought it difficult to connect academic theory to practicality, while the CBE cohort did not perceive theory and practice as two distinct entities (Bell & Mitchell,

2000). Dochy, Segers, Braeken, and Van Dinther (2014) found that students in CBE programs had higher levels of self-efficacy because program assessments were perceived to be authentic. Klein-Collins and Baylor (2013) found that CBE students appreciated having clear, defined competencies and as well as being able to use their personal experiences in the classroom. Students also liked how the CBE program was based in a real-world learning environment and could be tailored to their unique needs (Klein-Collins and Baylor, 2013). Reynolds and Sharpe (1992) found that students were positive toward CBE because they found the material relevant and meaningful. Rainwater (2015) surveyed students in CBE programs and found that students enrolled in the program liked it but felt CBE was most appropriate for experienced students with self-discipline. In a qualitative study, Wang (2015) found that "CBE students had a lot more confidence in their career preparation than traditional students, although the programs may struggle to teach certain soft skills" (p. 4).

Employer perceptions.

Finally, employer perceptions about CBE have been studied. Franklin and Lytle (2015) found that employer knowledge of CBE is low; however, those who do know about it are positive. Henrich (2016) found similar results in her study of 163 human resource professionals; she found that little employers knew about CBE but that they wanted to know more. The researchers also found that employers had difficulty articulating the competencies they were looking for when hiring a new employee (Franklin & Lytle, 2015). A staff member at Purdue University, an institution that offers CBE, could sympathize with this. Beals (2016) stated her experience:

As I watched my faculty colleagues invest their time to peel apart their degree

> programs to identify the competencies that make up their degree, I can appreciate a hiring manager's difficulty. Many hiring managers or even human resource representatives may struggle with this same task. (p. 1)

A group of panelists at a conference by CAEL discussed these issues but believed competencies in CBE programs cannot be valid without employer input (Wax, 2015b). The panel also discussed that employers are looking for soft-skills such as critical thinking, teamwork, communication, adaptability, and problem solving (Wax, October 2015). Research by Selingo (2016) on over 5,000 job postings found four common soft skills and only one hard skill wanted by employers. The soft skills included communication, organization, problem solving skills, and the ability to be detail-oriented (Selingo, 2016). Evers, Rush, and Berdow (1998) identified similar soft-skills including managing-self, communicating, managing other people and tasks, and mobilizing innovation and change. The only hard skill identified was mastery of Microsoft Excel (Selingo, 2016).

Subcategory 4: Case Study Research on Selected CBE Programs

The final subcategory of research on CBE includes case studies. CAEL, among others, is responsible for case studies about CBE programs at Valdosta State University, Davenport University, Indiana University, Peirce College, the Colorado Community College System, Lipscomb University, Southern New Hampshire University's College for America, Brandman University, Western Governors University, Salt Lake Community College, City University of Seattle, Sinclair Community College, Lord Fairfax Community College, Davenport University, Texas A&M, South Texas College, Capella University, and the University of Wisconsin, among others. Information on CBE

programs internationally has also been published (Bristow & Patrick, 2014; Hellwig, 2006, and Canning, 2000).

APPENDIX C – A Copy of the Competency-Based Education Network's Quality Principles and Standards for Competency Based Education Programs (May 2017 Version) as found here:

http://www.cbenetwork.org/sites/457/uploaded/files/CBE17__Quality_Standards_FINAL.pdf

Standard 1: Demonstrated Institutional Commitment to and Capacity for CBE Innovation

A. The institution's senior leadership and board members understand the role that CBE programs play in furthering or enhancing the institution's mission and support the creation, continuous improvement, and ongoing growth of CBE programming.
B. The institution has defined its approach to competency-based education, including the degree of autonomy given to programmatic-level design and delivery.
C. The institution has developed and adopted a faculty and staff model that would meet the unique needs of CBE program and complies with internal governance processes and controls while efficiently utilizing institutional resources.
D. The institution has developed policies and procedures for CBE program(s) which support learning and the learner experience, while maintaining compliance with regulatory requirements.
E. The institution maintains, across relevant academic and non-academic departments, sufficient administrative capability and commitment to manage and support competency-based education programs.
F. The CBE business model, including the tuition structure, has been analyzed to determine feasibility and sustainability.

G. The institution has evaluated technology needs to support the learner lifecycle (such as Student Information Systems, financial aid delivery systems and Learning Management Systems) and, where appropriate, made investments.

H. The institution has a plan for data collection and reporting regarding the learning experience and the efficacy of the CBE program. This data forms the basis for examination and discovery of needed improvements in areas such as learner performance across diverse groups, graduate success, and employer satisfaction.

Standard 2: Clear, Measurable, Meaningful and Integrated Competencies

A. Competencies represent explicit knowledge, skills, abilities, and intellectual behaviors, balancing theory and application in a demonstration of mastery.

B. Competencies are co-constructed with input from diverse communities such as employers, expert practitioners, subject-matter experts, faculty, learners, advisory committees, recent graduates, and professional/licensing bodies.

C. Individual competencies are relevant, current, and accurately depict the needs of employers and society.

D. Competencies are capable of anchoring, specifying, and guiding the learner experience, including curricular design, development of instructional content, activities, remediation offerings, and the assessment strategy.

E. Individual competencies are aligned to cognitive levels of learning using recognized taxonomies (such as the DQP or Bloom's) and/or industry standards.

Standard 3: Coherent Program and Curriculum Design

A. The set of competencies is clearly specified and provides easy-to-understand pathway(s) for what the learner must know and be able to do in order to progress in and complete a credential.
B. The program encompasses an integrated curricular sequence that scaffolds learning at appropriate cognitive levels leading to mastery and affords the learner flexibility in time spent to reach mastery.
C. The set of credential-specific competencies, chosen through a co-constructed process, represent the complete taxonomy of the knowledge, skills, abilities, and intellectual behaviors required by academic, workforce, and societal needs for a prepared and proficient credential holder.
D. Learners can articulate what they should know and be able to do upon completion of the program.
E. Learners have meaningful access to faculty subject matter experts who play an active, central role in the design and delivery of the program.
F. Learning environments, content, communications, activities and assessments are accessible to and inclusive of each learner, based on identified needs.
G. Learners are offered varied learning exercises, activities, and experiences to promote learner engagement and to provide multiple opportunities for development of competency mastery.
H. The program is designed to support individual learners with personalized learning pathway(s) as they develop and master competencies.

Standard 4: Credential-Level Assessment Strategy with Robust Implementation

A. Authentic assessments are built within and aligned to an overarching assessment strategy for the competency being measured and the credential being earned.
B. The assessment strategy clearly articulates how the set of assessments supports the learning journey for students, matches the cognitive level of the competencies being demonstrated, and determines mastery at the appropriate academic level.
C. The set of authentic assessments is designed to provide learners with multiple opportunities and ways to demonstrate competency, including measures for both learning and ability to apply (or transfer) that learning in novel settings and situations.
D. The assessment strategy and each of the assessments and their corresponding rubrics equitably measure learning outcomes across diverse student groups, while guarding against bias in formative and summative assessment.
E. Faculty understand the faculty role in the overarching assessment strategy for the credential and are trained in and can articulate the critical role played by each assessment in validating mastery of a competency.
F. Each authentic assessment is transparently aligned to program competencies and its corresponding rubric, is rigorous, has clear and valid measures, and is approved by faculty and assessment professionals.
G. Formative assessments serve as a tool for learning providing feedback for reflection and refinement while also offering a feedback loop that is timely and appropriate to the competency and intent of the assessment.

H. Summative assessments' ability to measure application or the "can do" aspect of a competency is validated by a subject matter expert, ideally one external to the program design team.

I. The assessment design accommodates personalization for learners by offering flexibility in when assessments will be administered, often supported by technology.

J. The timeliness of feedback from assessments enables learners to proceed with the absolute minimum of delay. Technology is used wherever possible to facilitate and expedite the timeliness of feedback.

Standard 5: Intentionally Designed and Engaged Learner Experience

A. The institution invests in deeply understanding the learners to be served by their CBE program(s), and this understanding is the foremost consideration when structuring the work of CBE professionals (faculty and staff) into specific roles and responsibilities.

B. The program is sufficiently resourced with faculty and staff to meet the needs of the learner. Faculty and staff roles are designed to provide differentiated support to a diverse range of learners that leverages the individual talents, strengths, and competence of the faculty and staff.

C. Faculty and staff performance metrics are established and monitored, in part, on the ability of the team to support learners, regardless of race, ethnicity, economic status or ability, throughout the learner experience.

D. Clear expectations are effectively communicated with the learner regarding institutional policies, structure and expectations of the program, and tuition and fees.

E. Learners have access to and proactive engagement with subject-matter expertise, robust resources, tools, and supports to be successful in acquiring and demonstrating the knowledge, skills, and abilities required for successful completion of the program.

F. Opportunities for engagement with peers, faculty, staff, and employers, who reflect the diversity of the learner population, are provided throughout the learning journey.

G. Leveraging technology-enabled systems and processes when possible, faculty, staff and learners proactively monitor data metrics to ensure the learner is fully informed, engaged and performing as anticipated throughout the learner lifecycle.

Standard 6: Collaborative Engagement with External Partners

A. In collaboration with faculty and staff, external partners offer their own expertise and resources, and are invested in and an integral part of the program design, delivery, and evaluation processes.

B. Faculty, staff, learners, and external partners regularly communicate on substantive matters, keeping each other informed of the latest developments.

C. Faculty, staff, learners, and external partners share their experiences and insights actively participating in, and sharing information with, researchers, discipline and career networks, and other professional organizations.

D. Faculty and staff implement necessary programmatic changes to stay current with industry trends, often based on information learned through their substantive communication with external partners.

E. External partnerships are cultivated to provide real life learning, training, assessment, internship, and employment opportunities.

F. External partners are chosen based on their alignment to program's purpose, the institution's equity goals, or field and workforce needs. When no pre-existing connections exist, faculty and staff are able to form these necessary relationships.

Standard 7: Transparency of Student Learning

A. The competencies required to earn a credential are clearly and openly articulated to learners, faculty, staff, and external partners.

B. The alignment of competencies, content, learning activities/experiences, and competency demonstration assessments is visible to all learners and stakeholders.

C. Student progression toward competency mastery and credential completion is visible throughout the learning journey to the learner, faculty, and staff.

D. The alignment of credential's competencies to any external requirements (licenses, transfer requirements, certifications, employer needs) is accurately and clearly communicated.

E. The institutional transcripting policy and process should be designed to communicate what graduates can do (beyond course listings and grades), expressed in ways understandable and relevant to an expanded community of stakeholders utilizing the input and engagement of learners, transfer institutions, graduate schools, and employers.

Standard 8: Evidence-Driven Continuous Improvement

A. The institution has adopted continuous improvement processes for CBE program(s) and is committed to sharing data and discoveries with the CBE community.
B. The CBE program has agreed upon performance goals (including equitable learner outcomes) and has effective and regular approaches for monitoring, measuring, surveying, analyzing, reporting, and acting on performance data (including specific learner outcomes).
C. The CBE program has a systematic process for improvement based on data and feedback from learners, faculty, subject matter experts, and external partners, and has allocated appropriately to support the work.
D. Other related data such as measurements of post-programmatic outcomes and the enduring value of earned competencies in the knowledge marketplace are monitored to inform larger shifts in the design of the competencies and credential being offered.

APPENDIX D - Limitations to Rubric for Research Question 1

After using the rubric for RQ1 as part of the study for this dissertation, Moskal and Leydens (2000) recommended that Researcher 1 and Researcher 2 discuss the infrequencies between their reviews to further clarify the rubric for future use. During this discussion, the two researchers discussed where they had and had not found alignment, which is a limitation to the rubric itself. This discussion can be found in Appendix D. For many of the indicators, the researchers found the alignment in the same standards. For example, in indicator 1.1, both researchers scored the alignment as a 2 and found the alignment in CBEN standard 1A. However, in indicator 2.5, Researcher 1 scored the indicator a 3 (by finding alignment to standards 5A and 5B) while Researcher 2 scored the indicator a 2 (by finding alignment to standard 5B only). Had Researcher 2 recognized that indicator 2.5 was also aligned with standard 5A, Researcher 2 agreed that they would have also rated that indicator as a 3 (instead of their original score of 2). Both researchers agreed that many of the May 2017 CBEN standards overlapped. For example, CBEN standards 2C and 6D are quite similar. CBEN Standard (May 2017) 2C says "individual competencies are relevant, current, and accurately depict the needs of employers and society." CBEN Standard (May 2017) 6D says "faculty and staff implement necessary programmatic changes to stay current with industry trends, often based on information learned through substantive communication with external partners." Because of this (and in some cases such as in indicator 4.5), the researchers scored the indicator the same but found the alignment in completely different standards. The researchers agreed that these overlaps led to assessment fatigue. An example of where fatigue occurred can be found in indicator 2.12. In indicator 2.12, Researcher 1

overlooked standard 6B but later agreed that their score should be adjusted based on re-reading standard 6B. Another example of a discrepancy between scores was in indicator 2.7. The first researcher came from a higher-education background and understood the term *academic freedom*, while the second researcher came from a K-12 background and was not as familiar with the term. Thus, the rating was different. Both researchers felt as though there were still some issues of terminology in the rubric which could be made clearer. For example, indicator 5.1 stated that 100% of assessments must have rubrics. Though both researchers found that indicator 5.1 aligned with standard 4D, they did not agree on the absoluteness of 100%; thus, Researcher 1 scored this indicator as a 3 and Researcher 2 scored it as a 2. Although this negotiation process after the blind-comparison was time consuming, it was valuable and can ensure that future reviews are more consistent. By continuing to perfect the rubric, future differences between rubric scores (in this case, 6.5%) may be reduced to increase inter-rater reliability.

APPENDIX E - Interview Guide for Research Question 2

Table 17

RQ 2 Interview Guide

Best Practice Source	Quote from source indicating what the best practice is	Question for RQ2 Interviews	Construct these questions amount to	Type of Evaluation from Fitzpatrick, Sanders, and Worthen (2011) based on question
Rowen (2015)	"Competencies need to be specific and measurable" (p. 3).	How does your institution ensure that the competencies can be measured? Does your institution have a written policy or procedure indicating this?	Determining Competencies	Decision-Oriented
McClarty and Gaertner (2015)	"CBE programs should clearly define their competencies and clearly link those competencies to material covered in their assessments."	Tell me about when assessment comes into play. Is it during or after the competencies have been defined? Does your institution have a written policy or procedure indicating this?	Determining Competencies	Decision-Oriented

Table 17 (continued).

DeMark (2016)	"At WGU, teams of faculty, content experts, and assessment specialists are charged with developing, monitoring, and maintaining assessment quality" (p. 86).	Who designs your institution's assessments? Who monitors them? How often are they updated? Does your institution have a written policy or procedure indicating this?	Designing Assessments	Decision-Oriented
DeMark (2016)	"The assessment teams also have access to psychometricians to pull and assess quantitative data in order to assure the reliability of assessments" (p. 86).	Does your institution have a psychometrician on staff? How is their expertise used? Does your institution have a written policy or procedure indicating this?	Designing Assessments	Decision-Oriented
Mattison, Sculthorp, and Zacharias (2017)	"Are assessments… • Realistic in activity or context? • Performance-based • Cognitively-complex • Formative? Do students… • Have to defend their answer? • Have to collaborate with each other or faculty? Is the scoring…	Tell me about assessments. Yes or no. Are assessments… Realistic in activity or context? Yes/ No Performance-based? Yes/ No Cognitively-complex? Yes/ No Formative? Yes/ No Do students…	Designing Assessments	Decision-Oriented

Table 17 (continued).

	• Known or transparent to the student? • Multiple indicators • Mastery" (p. 191).	Have to defend their answers?	Yes/ No		
		Have to collaborate with each other or faculty?	Yes/ No		
		Is the scoring…			
		Known or transparent to the student?	Yes/ No		
		Are there multiple indicators?	Yes/ No		
		Does it distinguish between mastery?	Yes/ No		
		Does your institution have a written policy or procedure indicating this?			
Assessing Courses and Programs (2016)	"The primary purpose of assessment is to improve students' learning and teachers' teaching as both respond to the information it provides" (p. 6).	Tell me about the formative assessment process. How do the faculty use that data to personalize the student's learning? Does your institution have a written policy or		Designing Assessments	Decision-Oriented

Table 17 (continued).

		procedure indicating this?		
Assessing Courses and Programs (2016)	"Assessments should cover knowledge, skill, and performance. Students should demonstrate they know these in different ways" (p. 10).	Are the assessments aligned to ensure knowledge, skill, and performance? Is it mapped out? Does your institution have a written policy or procedure indicating this?	Designing Assessments	Decision-Oriented
DeMark (2016)	"Assessment is current" (p. 87).	How does your institution ensure assessments are current? Does your institution have a written policy or procedure indicating this?	Designing Assessments	Decision-Oriented
Mattison, Sculthorp, and Zacharias (2017)	"Complex constructs are difficult to define, and are often times recognized because evaluators say 'they know it when they see it'" (p. 195).	How does your institution determine how to measure something that, at first, seems unmeasurable? Does your institution have a written policy or procedure indicating this?	Designing Assessments	Decision-Oriented
Holt and Perry (2011)	"The process must have transferrable results. When someone has been assessed within a particular organization, then the results will be	Particularly for an institution's general education competencies, how does your institution ensure the assessments are useful to multiple s	Designing Assessments	Decision-Oriented

Table 17 (continued).

	recognized in that organization. But what happens when that person applies for a job in another company- are the same results still recognized?" (p. 38).	stakeholders? Does your institution have a written policy or procedure indicating this?		
Holt and Perry (2011)	"The process must be repeatable. It may be desirable to have a competency assessment carried out every year. Once this has been done more than once, it is possible to then see the competency trend or the evolution over time. This evolution of competency is powerful and can demonstrate how a person's skills and abilities have changed over time" (p. 36).	Do the CBE programs at your institution offer any repeatable assessments for longitudinal tracking? Does your institution have a written policy or procedure indicating this?	Designing Assessments	Decision-Oriented
Wiggins and McTighe (2008)	"Most people don't self-assess their proposed assessments against any design standards, and they often end up with invalid inferences" (p. 185).	What is the process for approving assessments before they can be used in the classroom? Does your institution have a written policy or procedure indicating this?	Testing Assessments	Decision-Oriented
DeMark (2016)	"Assessment scores are normally distributed" (p. 87).	Does your institution test to see whether scores	Testing Assessments	Decision-Oriented

Table 17 (continued).

		are normally distributed? Does your institution have a written policy or procedure indicating this?		
DeMark (2016)	"Average number of attempts to pass is within an acceptable range" (p. 88).	Does your institution test to see whether the number of students who pass the assessment is within an acceptable range? Does your institution have a written policy or procedure indicating this?	Testing Assessments	Decision-Oriented
McClarty and Gaertner (2015)	"Providing validity evidence based on test content means showing the relationships between test questions or tasks and the defined competencies" (p. 6).	Does your institution provide evidence of validity? If so, where? Does your institution have a written policy or procedure indicating this?	Validity	Decision-Oriented
Rowen (2015)	"Each competency must be measured more than one time and in more than one way (that is, multiple choice tests, papers, presentations, performance-based, real-world	Does your institution require multiple sources of evidence before marking a student at the mastery level? Does your institution have a written policy or procedure indicating this?	Validity	Decision-Oriented

Table 17 (continued).

	assessments, etc.)" (p. 5).			
McClarty and Gaertner (2015)	"The processes students use to complete the assessment tasks must be an authentic" (p. 6).	How does your institution ensure the assessments are authentic and would be used in the real world? Does your institution have a written policy or procedure indicating this?	Validity	Decision-Oriented
McClarty and Gaertner (2015)	"While it seems preferable to assess clinical reasoning in a clinical setting, assessment designers must clearly describe how adequate reasoning skills are demonstrated in a test-taking scenario" (p. 7).	When the institution is not able to have an assessment in a clinical setting, how does your institution ensure a test-based assessment (for example) is still valid? Does your institution have a written policy or procedure indicating this?	Validity	Decision-Oriented
McClarty and Gaertner (2015)	"Relating performance on CBE assessments with performance in future courses or in the workplace—are crucial if CBE programs want employers to view their assessments and their competency thresholds as credible evidence of	Does your institution review performance on CBE assessments compared to performance as graduates of a CBE program? Does your institution have a written policy or procedure indicating this?	Validity	Decision-Oriented

Table 17 (continued).

	students' career readiness" (p. ii).			
McClarty and Gaertner (2015)	"There are different ways to measure different types of reliability, including test-retest (where students take the same test form on different occasions), internal consistency (which measures the extent to which students respond similarly to items within a single test form), and inter-rater reliability (where two or more raters evaluate the same student performance on a test). Students should receive approximately the same score if they take a test multiple times, regardless of the test form administered or the raters scoring it" (p. 7).	How does your institution test for reliability: test-retest, internal consistency, or inter-rater? Does your institution have a written policy or procedure indicating this?	Reliability	Decision-Oriented
Domaleski et al. (2015)	"Variability associated with tasks, raters, and occasions can be evaluated using generalizability methods; and the threats to generalizability can be ameliorated by ensuring that enough	Who monitors the reliability of your institution's assessments? Does your institution have a written policy or procedure indicating this?	Reliability	Decision-Oriented

Table 17 (continued).

	tasks are employed, and that rater accuracy and consistency are monitored" (p. 13).			
McClarty and Gaertner (2015)	"Although many CBE programs report developing reliable and valid assessments, reliability statistics are rarely publicly documented" (p. 8).	Are your institution's reliability statistics publicly documented? If so, where? Are your institution's validity statistics publicly documented? If so, where? Does your institution have a written policy or procedure indicating this?	Reliability	Decision-Oriented
Rowan (2015)	"Performance-based measures rarely have right and wrong answers. Instead, they are often projects that require subjective evaluation. Thus, strong rubrics and evaluator training are necessary to effectively measure student performance of these competencies" (p.6).	Does your institution utilize rubrics? Does your institution have a written policy or procedure indicating this?	Rubrics	Decision-Oriented

Table 17 (continued).

Assessing Courses and Programs (2016)	"Rubrics should have performance ratings and performance descriptions" (p. 12).	If so, do they have performance ratings and performance descriptions? Does your institution have a written policy or procedure indicating this?	Rubrics	Decision-Oriented
Rowan (2015)	"Strong rubrics also must be properly vetted to ensure that the descriptions are not ambiguous; that is, reviewers are interpreting the descriptions in exactly the same way each time" (p. 6).	Are the rubrics vetted before use? If so, what does that process look like? Does your institution have a written policy or procedure indicating this?	Rubrics	Decision-Oriented
Wiggins and McTighe (2008)	"It helps when students themselves identify the characteristics of an exemplary project so that they have a clearer understanding of the parts of the whole. This means exposing students to many student-generated and professional writing samples, guiding students to identify exactly what makes each a strong or weak writing piece, identifying the necessary skills, and	In the classroom, is there peer-assessment? If so, do the students use a rubric for the assessment? Does your institution have a written policy or procedure indicating this?	Rubrics	Decision-Oriented

Table 17 (continued).

	teaching those skills. Students now have a map for each unit" (p. 176).			
Wiggins and McTighe (2008)	"Faculty can re-define and refine rubrics based on student work" (p. 181).	Are rubrics re-defined? How does this process work? Is it based on student work? Does your institution have a written policy or procedure indicating this?	Rubrics	Decision-Oriented
Rowan (2015)	"Those reviewing students' work must be trained to properly use the rubrics. This training requires an explanation of the project, a review of each cell of the rubric, and sample projects for reviewers to evaluate in order to practice using the rubric. Training is a success when the rubric is performing consistently across reviewers of the same project, that is, a project is scored consistently across multiple reviewers" (p. 6).	Are assessors trained on rubrics? Does your institution have a written policy or procedure indicating this?	Training Assessors	Decision-Oriented

Table 17 (continued).

Mattison, Sculthorp, and Zacharias (2017)	"There is debate on how accurately authentic assessments can be measured if the instructors doing the evaluating lack the necessary skill sets and training. Teachers' inadequate training and ill-preparation for assessment, particularly authentic assessment, is well known" (p. 199).	How are faculty trained on assessment? Does your institution have a written policy or procedure indicating this?	Training Assessors	Decision-Oriented
Quality Principles and Standards for Competency-Based Education Programs: Demonstrated Institutional Commitment To and Capacity for CBE Innovation (2017)	"At the initiation of a program, a traditional faculty and staff model is in place but new models that support student learning in a CBE program are articulated. Action steps toward this new model and/or specialized roles (e.g., assessment specialist, instructional designer, coach) have been outlined. Faculty and staff position descriptions reflect an intentional model designed to support the CBE student effectively.	Please explain your institution's faculty/staff model as it relates to assessment. With new roles, how does the institution ensure substantive interaction between faculty and student (particularly for a direct assessment program, if applicable)? Does your institution have a written policy or procedure indicating this?	Faculty Role in Assessment	Expertise-Oriented

Table 17 (continued).

	Faculty/staff identified for specialized roles are aware of and agree on their roles and responsibilities" (p. 7).			
Mattison, Sculthorp, and Zacharias (2017)	"Faculty are not only responsible for evaluating learner competence, but also for providing the formative feedback necessary for learners' ultimate mastery of said competence" (p. 187).	What is the faculty's role in assessment? Are there multiple types of faculty that have different responsibilities regarding assessment? Does your institution have a written policy or procedure indicating this?	Faculty Role in Assessment	Decision-Oriented
Quality Principles and Standards for Competency-Based Education Programs: Credential-Level Assessment Strategy with Robust Implementation (2017)	"Faculty understand the faculty role in the overarching assessment strategy for the credential and are trained in and can articulate the critical role played by each assessment in validating mastery of a competency" (p. 17).	Are faculty required to undergo any sort of tests to ensure they understand how the assessment process works? Does your institution have a written policy or procedure indicating this?	Faculty Role in Assessment	Expertise-Oriented
McClarty and Gaertner (2015)	"CBE programs must determine how well a student must perform on the assessment in order to demonstrate competency—in other words, what is	How does your institution determine cut-scores? Does your institution have a written policy or procedure indicating this?	Determining Cut-Scores	Decision-Oriented

Table 17 (continued).

	the cut score that separates the competent from the not-yet-competent?" (p. 3).			
Mattison, Sculthorp, and Zacharias (2017)	"The definition of mastery is a compilation of Bloom's Theory and concepts set forth by Guskey and Anderman" (p. 188).	How does your institution determine what the mastery level is? Do they use Bloom's or something else? Does your institution have a written policy or procedure indicating this?	Determining Cut Scores	Decision-Oriented
McClarty and Gaertner (2015)	"In the case of CBE, the assessment cut scores distinguish those who receive credit (or various levels of credit) from those who do not. Because cut scores are central to the use and interpretation of CBE assessments, test designers must also gather validity evidence to support cut-score placement" (p. 4).	Does your institution use research to determine cut-scores? Does your institution have a written policy or procedure indicating this?	Determining Cut-Scores	Decision-Oriented
McClarty and Gaertner (2015)	"Empirical links (like job performance) should also used in the standard-setting process so providers develop cut scores that truly	Is job performance used to determine cut-scores? Does your institution have a written policy or procedure indicating this?	Determining Cut-Scores	Decision-Oriented

Table 17 (continued).

	differentiate masters from non-masters" (p. ii.)			
Quality Principles and Standards for Competency-Based Education Programs: Credential-Level Assessment Strategy with Robust Implementation (2017)	"The assessment design accommodates personalization for learners by offering flexibility in when assessments will be administered, often supported by technology" (p. 17).	Can assessments be taken at any time? Does your institution have a written policy or procedure indicating this?	Flexibility	Expertise-Oriented
Quality Principles and Standards for Competency-Based Education Programs: Credential-Level Assessment Strategy with Robust Implementation (2017)	"The timeliness of feedback from assessments enables learners to proceed with the absolute minimum of delay. Technology is used wherever possible to facilitate and expedite the timeliness of feedback" (p. 17).	Is there a policy regarding how long it must take for assessment results to be provided to the student? Is it automated using technology? Does your institution have a written policy or procedure indicating this?	Flexibility	Expertise-Oriented
McClarty and Gaertner (2015)	"CBE programs should continue to collect and monitor graduates' life outcomes in order to provide evidence that a CBE credential stands for a level of rigor and preparation equivalent to a traditional postsecondary degree" (p. iii).	Does your institution monitor the progress of graduates? Does your institution provide any studies comparing outcomes of CBE to outcomes of traditional programs? Does your institution have a written policy or procedure indicating this?	Comparing to a Traditional Degree	Decision-Oriented

Table 17 (continued).

Domaleski et al. (2015)	"CBE assessments may be incorporated into larger accountability systems and used to serve policy aims" (p. 15).	How are data from the assessments used in continuous improvement for the institution? Does the institutional effectiveness office use the data? Does your institution have a written policy or procedure indicating this?	Continuous Improvement	Decision-Oriented
Quality Principles and Standards for Competency-Based Education Programs: Credential-Level Assessment Strategy with Robust Implementation (2017)	"The assessment strategy and each of the assessments and their corresponding rubrics equitably measure learning outcomes across diverse student groups, while guarding against bias in formative and summative assessment" (p. 17).	How does your institution equitably measure learning outcomes across diverse student groups, while guarding against bias in assessments? Does your institution have a written policy or procedure indicating this?	Diversity	Expertise-Oriented
DeMark (2016)	"Assessment is ADA compliant" (p. 87).	Are your institutions' assessments ADA compliant? How do you ensure this? Does your institution have a written policy or procedure indicating this?	Diversity	Decision-Oriented
DeMark (2016)	"Assessment avoids bias and sensitivity issues" (p. 87).	How does your institution sensitive issues? Does your	Diversity	Decision-Oriented

Table 17 (continued).

	institution have a written policy or procedure indicating this?

APPENDIX F – IRB Approval Letter

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 17111008
PROJECT TITLE: Interview with CBE Administrators
PROJECT TYPE: Doctoral Dissertation
RESEARCHER(S): Elizabeth Giddens
COLLEGE/DIVISION: College of Education and Psychology
DEPARTMENT: Educational Research and Administration
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Exempt Review Approval
PERIOD OF APPROVAL: 11/16/2017 to 11/15/2018
Lawrence A. Hosman, Ph.D.
Institutional Review Board

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